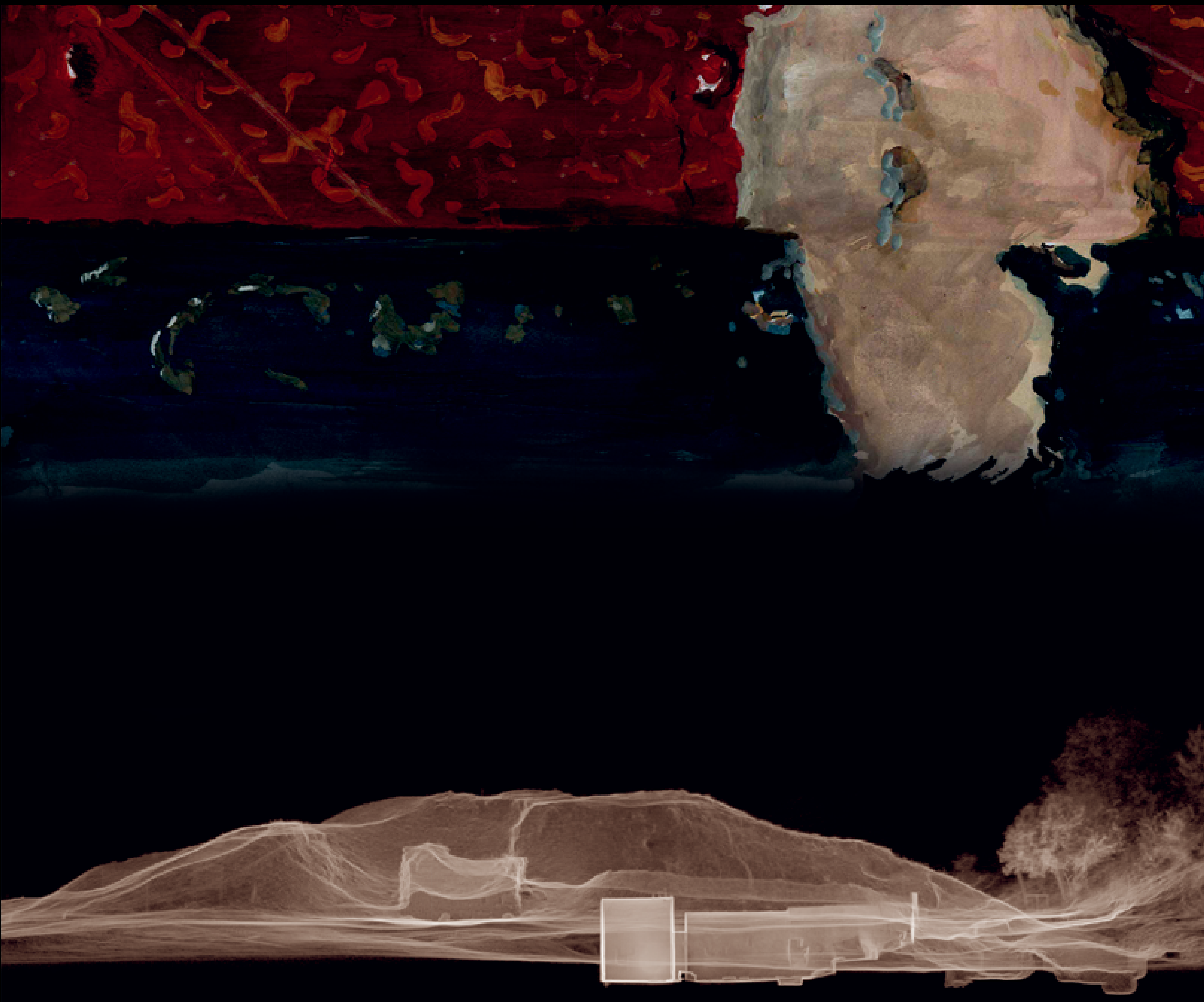
A Monumental Hellenistic Funerary Ensemble at Callatis on the Western Black Sea

The Documaci Tumulus
Volume I



edited by

Valeriu Sîrbu, Maria-Magdalena Ștefan and Dan Ștefan

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Front cover: detail of the funerary chamber plastered walls as drawn by artist Florentina Marțiș;
3D model of the tomb by Dan Ștefan

Back-cover: Documaci tomb in 1993, photo credit: Teodor Bănică

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Introduction

> 'Tell me, Lion, devourer of bulls, whose tomb dost thou figure? Who among men was accounted worthy to share in thy prowess?'
>
> *(Anthologia Palatina, VII, 426)*

The contributors to this volume faced the challenging task of assembling a compelling first monographic study dedicated to one of the most important, and probably spectacular, ancient funerary monuments recently excavated on the western Black Sea shore – the Documaci Tumulus, near Callatis. This meant navigating stormy waters while deciphering an intricate trail of secondary interventions and modern destructions, and attempting to recognise, at least in part, the complex connections the monument established with the wider Hellenistic milieu, or with the effervescent political arena of the Diadochi Wars.

The heavy responsibility the contributors carried came in particular from the long period of delay and neglect the monument had to endure before anything scientific on it could enter the academic arena. No less than 27 years had to pass since its discovery, in turbulent conditions, and for the excavations to resume, from which the state of knowledge could help us gather enough momentum to reach the current status of the site – still only half-way, however, and awaiting the much-needed and longed-for preservation that the site merits for future generations.

The significance of the Documaci Tumulus as a funerary ensemble resides in its potential to fuel discussions about the mechanisms of ritualized identity expression in mixed cultural environments, functioning under the pressure of political change, and about community membership, symbolic discourse and ancestors – all reflected in 'le jeu des miroirs' of funerary practices. Even if there were not a unique and standardized 'Greek way' to undertake a funeral, the ostentatious graves of the Classical or Hellenistic period, built in the vicinity of the Greek cities founded on the western and northern Black Sea shores, featuring monumental architecture or rich inventories, or culturally mixed ritual references, have been on more than one occasion considered rather non-Greek. It is here that the Documaci mound opens a door into how the community of a Greek *polis*, located on the periphery of the greater political stages of the day, involved in a myriad of connections with assorted local populations, deals with the great changes in mentality and cultural openness the ancient world experienced after the death of Alexander the Great, under the pressures of Macedonian competition for power.

If the usual curiosity regarding identity when one deals with monumental tombs involves the commissioners – the dead themselves or their families, the contribution of our research was that the answers we received revealed instead more about the ancient artisans: the architects, builders, masons and painters. They are the main characters of this story, forging networks of artistic ideas, sophisticated applications of mathematic calculations and aesthetic ideals that functioned with intense vivacity at the beginning of the Hellenistic period over wide areas, joining up the dots of dispersed political interactions. Although on a smaller scale, the Documaci mound finds its closest analogies in the constructive model and techniques of Vergina's *Megali Toumba*, in particular the inner rectangular stone chambers used to heap and strengthen a massive embankment, of the *Kastas* mound at Amphipolis and Eretria's *Tomb of Erotes*, all with their central bases designed to support a monumental top to the mounds. Analogies can also be made with Yigma Tepe (Pergamon) and Kastas (Amphipolis) in terms of proportions and ancient measuring units. At the same time, reminders of other construction details appear in the Olbitan milieu, while the ritual details involving commemorative activities set our site within the sphere of Pontic and Callatian funerary practices.

The following chapters gather together the collective efforts of a group of Romanian and Bulgarian researchers, funded by the Romanian Ministry for Research and Innovation, presenting the results of a project of nearly three years, involving five archaeological field campaigns carried out between 2017-2019 by the Institute of Archaeology 'Vasile Pârvan' in Bucharest, in collaboration with the local 'Callatis' Museum, Mangalia. Designed to be essentially a monographic archaeological report with interdisciplinary components dedicated to a single monument – a tumulus funerary ensemble with commemorative elements, dated in the early Hellenistic period (Documaci Mound/Tumulus), the selected studies interlaced as chapters aim nevertheless to provide, when possible, short and synthetic contextual aspects to facilitate the understanding of the technical details of specialisms and technicalities. Thus, the reader will gain insights to the monument via introductory chapters on the features of the wider archaeological and geographic landscape, including the neighbouring Dorian city of Callatis, or about more general aspects of the Diadochi Wars and their use of the Pontic area as secondary stage for their power struggles. Along the way, the analysis will present several analogies for the investigated structures in Thrace, Macedonia, and the northern Black Sea area. In addition, because we are offering the first general presentation of the monument, close attention had to be paid to the clarification of the history of research and to the presentation of the various documentation methodologies applied.

Even with all our efforts, however, due to the monument's complexity, requiring further investigation, the current contribution has to be seen just as a first step in a longer series to be dedicated to the tumulus and its surroundings.

Alongside the core investigators, who eventually became contributors to this volume, we would like to thank also all those generous people who by their work, either in the field or in the office, with wise words and kind thoughts, supported our researches at the Documaci Mound and made the current volume possible: Tatiana Odobescu, Lucian Nichita, Iulian Bîrzescu, Alix Barbet, Teodor Bănică, Nicoleta Stăncilă, Diana Gergova, Alexandru Avram, Michaelis Lefantzis, Dimitra Malamidou, Milică Copu, Andreea Teodor, Bogdan Teodor, Julia Valeva, Carmen Bem, Dragoș Hălmagi, Valerii Kavruk, Dan Buzea, Ștefan Mariș, Alexandru Țara, Alexandra Cătălina Florea, and Oana Abalaru.

With hopes for a brighter future for the Documaci Tomb and the Callatis archaeological area,

The Editors

Chapter 1
The History of Research at Documaci Tumulus

Valeriu Sîrbu, Maria-Magdalena Ștefan

An unknown... famous monument

As the summer of 1993 was approaching its end, news reached the small Romanian history museum of Mangalia that, in the vicinity of the city, an excavator operator uncovered stone constructions which could be ancient. These accidental discoveries were not in any case surprising. In Mangalia, a famous historical Romanian seaside resort and large commercial harbour platform on the Black Sea, ancient vestiges are everywhere, springing from the ground at almost all interventions. The site is Callatis, an ancient Dorian establishment founded by colonists from Heraclea Pontica in the distant realms, where Thrace and Scythia blurred their borders, geographically and culturally (Figure 2). Mangalia and Callatis have been also interlacing, affecting each other's fate frequently, especially during the last century, when modernisation and progress clashed, more than once, with one of the richest archaeological regions on the western Hospitable Sea – *Pontus Euxinus* – in an unfair battle, where losses were usually countable on the heritage side.

As soon as the archaeologists, led by the museum's director, an experienced excavator of Black Sea antiquities, Valeriu Georgescu, reached the site of the discovery, they understood that the monument could well be significant. When the heavy machine had taken soil, illegally, from a large funerary mound located 3 km west from the modern city, several stone structures were partially revealed and damaged. Among them a chamber-tomb, built of dressed limestone blocks, became the prime focus of the archaeologists' attention (Figure 1). For several campaigns (1993-1995), the tumulus, labelled on the Romanian Military Maps of the 1970s as *Movila Documaci*, 8 m high, was archaeologically investigated[1] in a large-scale operation led by Georgescu, and including the use of machines, becoming an archaeological sensation of the region. It was, for example, the main attraction for the participants of the International Congress of Thracology, held in Constanța and Mangalia, in 1996, and the subject of a documentary video recording by Romanian Television in 1993.

As its first investigators found out during the research, the tomb, consisting of a 3.59 m x 2.99 m chamber, covered with a semi-cylindrical vault, and with a long access corridor, identified then on just 9.8 m (out of what will prove later to be 17.8 m in length), had been looted in Antiquity. Traces of early Roman pottery were found inside, as well as 'large quantities' of Late Roman ware (5th-6th c. AD) (Georgescu *et al.* 1996). Despite these earlier depredations, some of the walls still carried the traces of ancient, plastered decorations, including painted surfaces in coloured bands and marble imitation. Sometime during the 9th-10th c. AD, crude graffiti of ships, bannermen and wild animals were scratched into the plastered *dromos* walls. Their raised position, in comparison with the initial walking level in the tomb, suggests that, by then, the tomb was already partially filled with soil and debris.

Taking into consideration the very few artefacts discovered (two three-bladed bronze arrowheads, one fragment of a stamped Heraclea Pontica amphora, a gold finger ring) the building was dated broadly during the 4th-3rd c. BC. This would make the painted plasters preserved in the funerary chamber and part of the *dromos*, the oldest surviving examples, at such scale and *in situ*, on an ancient built structure found on the territory of modern-day Romania. For this period and space, chamber-tombs under embankments of soil (tumuli) have been especially rare finds. Romanian archaeologists and the public, however, were accustomed to them being discovered further south, in Bulgaria and northern Greece, or further north, in Crimea. In addition, an entire international historiographical tradition opted to divorce the ostentatious chamber graves built during the Classical and Hellenistic period in the western and northern Black Sea areas from what was perceived as 'proper Greek' burial practices. Following this tradition (Condurachi 1951; Irimia 1984), Documaci Mound was consequently assumed to had been either the grave of a high-status Thracian, or Scythian chieftain.

During the excavation of Documaci Mound, in addition to the chamber-tomb with *dromos*, Georgescu and his team found in its vicinity various other stone walls, described as 'rings', and a massive rectangular stone construction (*c.* 5 m x 6 m, 5 m high), with faces and filling, without entrances, unclear in function at the

[1] We later estimated the researched area (at least seven trenches) to be of at least 500 m².

Figure 1. Image dated 1993: a view of the tomb and socle from the east taken during excavations ('Callatis' Museum of Mangalia archive).

time of excavation. Believing it, initially, to be another chamber tomb, Georgescu regrettably excavated mechanically around it, and in it, in order to find an 'entrance'. Precious stratigraphic information was then lost. In 1995, following a dispute with the National Commission of Archaeology, the direction of the excavation at Documaci changed. A new team was assembled, including Maria Coja and Elvira Safta from the National History Museum in Bucharest and Tudor Papasima, from the Museum of Archaeology in Constanța. Despite the administrative changes, *de facto* in the field, it was still Georgescu who remained in charge of the works. At various moments during the 1993-1995 period, several junior researchers and history students participated in these excavations, also including Mihai Ionescu, Robert Constantin, Nicolaie Alexandru and Valeriu Maxim, all of them currently active in archaeological investigations in Mangalia.

Unfortunately, despite the scale of the work, its great renown, and the obvious significance of the monument, the excavation results were never published, with Georgescu dying in 2002, followed soon by Maria Coja. The monuments did not find their way onto the touristic circuit, and, 25 years later, the available documentation left behind amounted to less than five full pages of typed text, a handful of black and white images,[2] and several poor-resolution photographs of the stratigraphic profiles drawn in 1995 by Mihai Ionescu. Except for the gold ring (Figure 190/a-b), the other discovered artefacts were impossible to locate in the Museum's deposits – which, in the meantime, were moved and transformed several times. The gold ring disappeared from the Museum's 'Callatis' exhibition in 2016, stolen, together with other valuable artefacts. What was worse, the authorities, despite repeated efforts, failed to ensure effective conservation measures for the long-term security of the monument. In the year following the discovery, the entrance to the *dromos* was sealed with a metal door, and the entire tomb structure covered with a protective, lightweight, metallic gable-roofed structure (Figure 68/c). However, the isolated position of the mound, outside the city and in the fields, made it vulnerable. Damage and theft of the metallic elements were noted repeatedly, and thus the conservation solution implemented by the Museum changed; in a desperate attempt to shelter the place, a reinforced concrete door (Figure 3) was added, and a board roof with a bitumen membrane, then covered with soil, was put in place.

[2] Georgescu *et al.* 1996; Sion 1999.

The 'Callatis' Museum and the Mangalia Local Council made two major attempts to include the tomb in a national conservation programme, one in 1999, following extensive damage caused by an excavator to the eastern side of the socle, and the other in 2012, in the context of a European funded project. Both schemes were eventually halted in their early stages, especially due to ownership uncertainties concerning the land on which the monument was situated, and the proximity of a military shooting range. Nevertheless, during the 1999 works, the tomb benefitted from an architectural survey undertaken by the architect Anișoara Sion, then an employee of the state's Direction for Historical Monuments. Even if her documentation was not necessarily made with the objective of studying the grave, it still remains to date the most important body of data describing the results of the 1993-1995 excavations.[3] Sion made several significant observations concerning the building features, including some archaeological details; she had also proposed the interpretation for the rectangular stone construction as a pedestal for a funerary monument (a socle).

As decades passed after the tomb's discovery, the concrete door slowly reduced the interior ventilation, a situation which, combined with the increased lateral rainwater infiltrations and the injudicious way the tomb was excavated (removing its surrounding filling), accelerated the plaster and stone degradation. In time, the bitumen roof disintegrated, the soil covering was washed away by rain, allowing plant roots and rainwater to drip inside. What had remained from the once monumental embankment (about 25%), and the rectangular stone pedestal built in the chamber-tomb's vicinity, remained uncovered from the elements and vegetation, from 1993.

Sometime during the interval 2012-2017 the concrete door was forced, then left open. In those years, the tomb was used as a rubbish dump and shelter for shepherds. This was the moment, and the conservation status, when the current contributors to this volume started a new chapter in the history of research at Documaci Mound.

New beginnings

In 2011 the tomb attracted the attention of Iron Age researcher Valeriu Sîrbu, then deputy director of Brăila Museum, and Maria-Magdalena Ștefan and Dan Ștefan, archaeologists working for a private Romanian research company. They established contacts with the Mangalia Museum through a local archaeologist, Mihai Ionescu, who offered access to the available documentation from the excavations of the 1990s, and to Anișoara Sion's architectural plans and sections. It was then that a first collaboration protocol was established, some digital measurements of the tomb interior recorded, and actions initiated to obtain financial support for restarting excavations.

Unfortunately, this could not be achieved until 2017, 24 years after the tomb's discovery, when a national research project competition was won by the Romanian Academy Institute of Archaeology, 'Vasile Pârvan' in Bucharest. A team was subsequently assembled including: Valeriu Sîrbu (archaeology), Maria-Magdalena Ștefan (covering the project's fields of excavation and stratigraphic documentation, topography, GIS, and remote sensing), Dan Ștefan (dealing with archaeology, geophysics, UAV, and thermal vision), Alexandra Teodor (architectural documentation of the tomb interior, integration and analysis of earlier architectural surveys, and archive work), Valentina Cetean (geology, petrographic surveys, plaster and pigment analyses, and evaluation of structural degradation of ancient built structures), Alexandru Halbac (technical support for archaeology, geophysics, and topography), Florentina Marțiș (stratigraphic documentation, ceramic studies, stratigraphy, and archaeology), and Călin Șuteu (close range photogrammetry, and H-RTI). To this team, Mangalia's 'Callatis' Museum was a partner, represented overall by Tatiana Odobescu and Lucian Nichita, and, in the field, by the archaeologists Nicolaie Alexandru, Mihai Ionescu and Robert Constantin. Gradually the project came to life, under the named 'KALLA – The Interdisciplinary Exploration of Tumuli Landscapes and Monumental Hellenistic Tombs in Callatis',[4] in the period August 2017 - November 2019, with funds from the Romanian Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI). This current volume is very pleased to be presenting some of the results of the respective investigations.

The general objective of project KALLA was to investigate the Documaci Mound ensemble within the larger background of the tumuli necropolis of Callatis, in a context whereby the ancient site as a whole has only been researched in the light of rescue excavations, while constantly being altered by modern urban developments. It was also hoped that the study, once published, would become the base for a future, much needed, conservation project. The planned project activities have been based on a step-by-step approach, with employed methodologies adjusted to the spatial extent of the target. Thus, the necropolis was studied by aerial archaeology and remote sensing methods, followed by geophysical prospections at key-points,

[3] Although the survey made by Anișoara Sion at Documaci corresponds to documentation dated 1999, some of the measurements (at least those of the *extrados* of the vaults) were probably made starting with 1993, since according to the available documentation, in the spring of 1994 the tomb was covered for protection.

[4] PN-III-P4-ID-PCE-2016-0621; www.kalla.net4u.ro.

Figure 2. Maps of Mangalia; b) detail of a 1944 German aerial image from WW II; c) satellite image (2019) depicting Lake Mangalia and the modern harbour area between the city of Mangalia and the villages 2 Mai and Limanu.

while at Documaci Mound itself a thorough electrical resistivity survey and a close-range photogrammetry analysis of the micro-relief, grounded the opening of new trenches. The purpose of these new excavations was to allow a revaluation and completion of the existing inadequate documentation and to answer questions about the significance of certain structures, the sequence of building phases, and the long list of interventions. Great emphasis was placed on the architectural study of the tomb interior and physical-chemical analysis of the ancient plasters and pigments.

From 2018 the network of collaborators was enlarged to include Eugenia Tarassova, Mihail Tarassov and Rositsa Titorenkova, mineralogists from the Institute of Mineralogy and Crystallography of the Bulgarian Academy of Sciences; this team analysed the ancient plasters and pigments inside the tomb at Documaci. Also starting in the autumn of 2018, a group of students from the Polish Faculty of Archaeology, University of Rzeszów, took part in the project's field activities, under the supervision of researcher Tomasz Bochnak. During the excavations and architectural surveys, the core scientific team was aided by archaeology student Ștefan Mariș, and two PhD students in architecture, Alexandra Florea and Oana Abalaru.

The analysis of the Hellenistic pottery found at Documaci was undertaken by Livia Buzoianu, an archaeologist from the Museum of National History and Archaeology in Constanța and chief excavator of Albești, a Hellenistic fort in the *chora* of Callatis. The early medieval graffiti on the tomb walls were studied by Oana Damian, and the archaeozoological remains by Adrian Bălășescu – both specialists from the Institute of Archaeology 'Vasile Pârvan' in Bucharest. Veteran architect Anișoara Sion visited the new excavations several times, endorsing the integration of her previous knowledge about the monuments within the ongoing investigation framework.

As the project progressed, contacts were established, in late 2018, with retired architect Teodor Bănică, who, as an employee of the Direction of Historical Monuments in Constanța in 1993-1994, had initiated the first official application to declare the Documaci Mound tomb an historical monument. Following his lead, several valuable documents were subsequently identified by Al. Teodor in the National Institute of Heritage Archive, including a series of drawings (Figure 105) documenting the plaster conservation, and the photographs of French art historian Alix Barbet (Centre d'Étude des Peintures Murales Romaines), who briefly studied the Documaci tomb in 1993 as part of a larger project of international survey campaigns funded by the French Ministries of Culture and Foreign Affairs. Subsequently contacted by Al. Teodor, Alix Barbet kindly gave the current team her permission to use these materials and provided high-resolution versions of the images. Several observations recorded by A. Barbet proved to be identical with some of ours, made prior to accessing her work, for example the integration of the painting scheme at Documaci within the typical Hellenistic programme, mimicking in plaster and paint true architectural elements. For the campaigns of direct interest here, the French team consisted of the following members: Alix Barbet (coordination), Corine Bertrand and Agnès Schmidt, Florence Monier, and Philippe Foliot in 1994, and the same team in 1996, in which Radu Ciobanu also participated to assist with measurements and drawings.[5]

As it turned out, Teodor Bănică, on his 1993 site visit, also took several photographs (Figures 133/c; 131/b), which were likewise kindly placed at our disposal. All together, these newly found earlier materials proved most valuable, especially within the context of the general impoverished status that characterised the documentation available for the excavations of the 1990s. They reveal certain aspects about the thickness of the deposit excavated inside the *dromos*, and about the temporary protection measures taken in the immediate period of the work. Combined with photographic documentation, the mapping of the painted plaster in the funerary chamber is also of great value, as it is the only tool with which we can establish the scale of subsequent losses of this artistic material.

[5] Barbet *et al.* 1994: 18, Figs. 38-41.

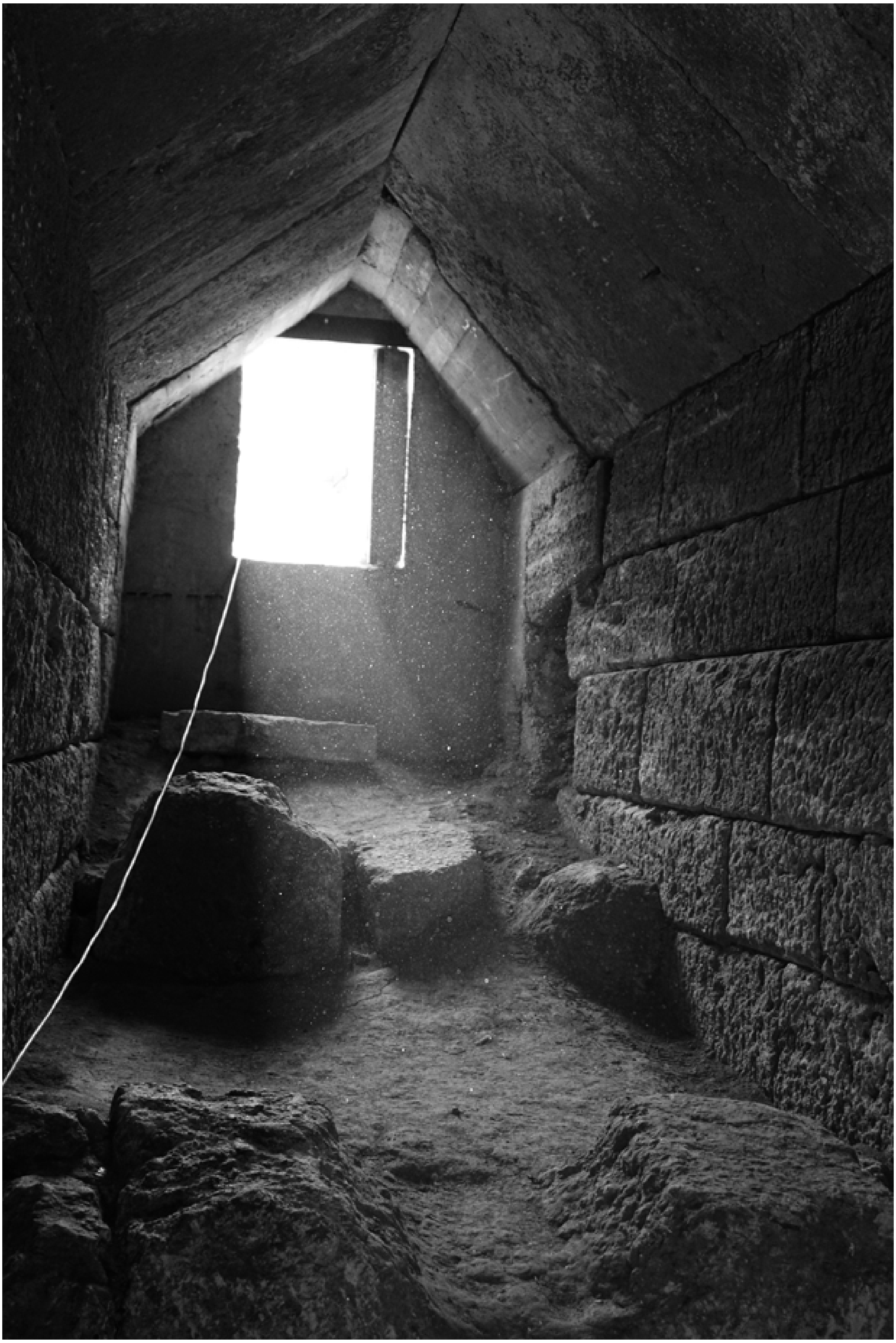


Figure 3. The current tomb entrance is framed by a concrete door, here seen from inside *dromos II*. For lighting the team used generators and cables.

Chapter 2

Research Objectives and Methodologies

Valeriu Sîrbu, Maria-Magdalena Ștefan, Dan Ștefan

An archaeology of destructions and secondary interventions[1]

Hellenistic tumuli have frequently – even more so those of monumental proportions housing chamber tombs – been loci of interest, attracting people (not necessarily in a cultural or chronological filiation) and human activity for centuries – rebuilding, reuse, revisiting, commemoration, various forms of looting, and even archaeological excavations – all leaving their traces, smaller or larger, even sometimes changing the structure of the initial deposits.

At least two building phases of the Documaci tomb are assumed early on, as the *dromos* exhibits clear differences in the way the interior wall surfaces were treated and the roofing solution implemented between its two sectors – semicylindrical and plastered first, then extended with unplastered walls and gable roof (Figure 134/c). This variation of the access corridor was interpreted as a necessary restyling once the mound was enlarged. Evidence of looting was supposed by Georgescu's team, beginning from the early Roman period, while for the 5th-6th centuries AD he considered that only a phase of actual habitation inside the tomb could explain such 'a large quantity' of late Roman sherds inside and outside the tomb entrance (mainly amphorae remains).

During our recent excavations made inside the funerary chamber (S9), two looting pits, filled with the debris of the destroyed interior furniture, could be observed (Figure 122/b). They were obviously made at different intervals as one cut the other; the most recent materials found inside belonged to the 5th-6th c. AD. Moreover, the new excavations revealed that above the foundations of the destroyed segment of the *dromos* (in trenches S1, S8), intense activities, mainly related to stone dismantling, but also remains of light structures, dated to the 5th-6th c. AD, could be documented as well, organised into at least three stratigraphic superimposed layers (Figure 143).

The new trenches (S10) opened in the western side of the mound showed that part of the central socle was removed as a source of worked-stone, or during an organized massive looting event at some point in the early modern period: Ottoman-period pottery mixed with stone debris was found in the upper layers of the embankment. In the preserved western part of the embankment, part of its upper filling may in fact represent the remains of an access ramp used during this systematic dismantling of the socle (Figures 46/a; 60/b).

Due to the lack of documentation, the archaeological investigations from the 1990s, using mechanical diggers, and the various conservation procedures affecting especially the eastern side of the *dromos*, are also included in the secondary interventions category as they involved modifications to the stratigraphy of the site, moving earth and stones, and have to be distinguished from the ancient structures. Earlier alterations of the mound shape and stratigraphy must also have happened, very probably during the late 1960s, when the Mangalia military firing range facility was built at the mound's eastern periphery; furthermore, significant, and even earlier, levelling and intrusions in the embankment were recognized in the stratigraphic sequences available for the northern sector (Figures 36/e; 62). Some undocumented exploration activities by Vasile Canarache (archaeologist and antiquarian of Dobruja), around the 1950s, can be assumed in the larger area of the Documaci Hill (Canarache 1950: 242). Additionally, the state of the plastered walls suffered severely after the tomb's uncovering, making the identification of secondary interventions of various ages from the initial design even more challenging.

Thus decoding the history of interventions in Documaci, either ancient or modern, and the discrimination between their destructive, ritual or other nature, proved to be two of the leading objectives of our actions, justifying, in a way, the inclusion here of such specific details regarding the people historically involved, or of their trail of actions and resulting documentations, in a study otherwise meant to appeal to an international audience, probably less familiar with the perils of Romanian archaeology at the beginning of the post-Communist period. The first two chapters may, nevertheless, be regarded as providing glimpses into our investigative roots and the technical issues of recording and organising archives and databases, doing

[1] Significant archive work was done by Alexandra Teodor, whose work identified the Alix Barbet file, and the association with Teodor Bănică confirmed.

our best to give the necessary credits to those who initially assembled the unpublished data used here (see Table 1, Table 2). We also took the opportunity to reveal what we could about the reflexive process of dealing with incomplete or uncertain data. This approach is also a metaphor for the fragility of archaeological heritage and a warning about the consequences of excavating without documentation. The interpretation of the monument's function, time-use and chronology were established within this general background of dealing with a complex site which was not a classic, closed funerary context – but the result of a long utilisation period.

How to ask the right questions

Taking into consideration the scarcity of the available documentation for the 1993-1995 excavations, the shortness of our funding interval (only 30 months), and the fact that the activities at Documaci (basically five field campaigns of two to four weeks, 2017-2019) represented just one of the many components of the broader 'KALLA' project, the established research objectives concerning Documaci were mostly of a technical nature, focused on data acquisition and digitisation. We wanted to record as much as possible of what was left, planning to valorise and analyse the data in stages, from which this book is only a first step.

Because at the start of the project, no artefact from Documaci was practically available (being either lost or unaccountable), except for some fragments of painted marble, considered then elements of a doorway frame, the question of the chronology of the tomb (moment of building, moment of reuse and modification, destruction, post-ritual life) was open. In this context, the understanding of the architectural model and module, and of their relations with the overall design of the mound as a whole, if such an holistic view really existed, were obviously regarded as having the potential to offer indirect clues about chronology and cultural influences.

Even if some of the older trenches were reopened during 2017-2019 (part of an unnamed trench perpendicular to the modern tomb entrance (SIV/1994?), and part of SIII/1995 – perpendicular to the funerary chamber), while new excavations were made, mainly to verify the geophysical survey results, they nevertheless remained just a smaller part of what was excavated during 1993-1995; not to mention that many important structures and stratigraphic relations were left unverified due to lack of time and the unexpected complexity of the discoveries. Therefore, understanding as much as possible of the earlier documentation was essential, as it was the assessment of their degree of confidence. The completion, verification and correlation of the older documentations with the field situation, inside and outside the tomb, was absolutely necessary to understand the initial limits of the mound, its stratigraphy, and the constructive details of its composing parts.

On a second level, data was recorded having in mind, not only the scientific analysis, but also the need to elaborate a conservation project. Even if the KALLA project allowed funds just for research, it was assumed by the team that further efforts will be made to ensure the development of such a proposal.

The archaeological structures and contexts were usually documented multiple times by employing different methodologies. For example, the tomb's interior walls were recorded in their entirety – photogrammetrically with high-resolution cameras and visible markers and mobile light (Figure 7), then sectors of interest studied with Highlight-Reflectance Transformation Imaging (Figures 172-174), while the general geometry of the interior was derived from measurements with a red laser total station. Manual additions were made on site on the printed orthophotos (resulting after the processing of the photogrammetric survey), georeferenced with the total station measurements and combined with the architectural initial plan prepared by A. Sion in 1999 (Figure 126). The walls of the funerary chamber were also hand-drawn, based on manual measurements and laser levels, for an interpreted representation of the architecture and plaster covering (Figures 91-92). Various onsite observations made in oblique light (Figures 100/b-c; 114 /a) proved to be essential. In addition, portions of the painted plasters from the funerary chamber were replicated with acrylic colours by an artist in order to experiment the colour mixing and general atmosphere (Figure 152/c-d). This seeming doubling of recorded data ensured, in fact, verification, integration and perspective, being a multiple-step process of recording, analysis and interpretation. No documentation activity is completely unbiased: each method and their results embody a certain type of interpretation process, adding layers on layers of information and context.

Despite the technicity and apparently superfluous insistence on details not instantly relevant, the research was always carried out, and, sometimes, even designed to follow larger topics, e.g. contributions to the study of Hellenistic funerary architecture, especially of Macedonian tomb types, the relations between local populations, Thracians and Scythians, and the western Black Sea Greek cities during the wars of the Diadochi and their heirs, or the contributions to developing methodologies for the investigation of the embankments of the very large mounds.

Questions like when was the socle for the free-standing monument built, in relation to the tomb; what was placed on top of the mound and supported by the huge socle; how was access to the tomb from the exterior ensured; how many building phases did the mound have; how many burials were made inside; what can the bare walls of the funerary chamber still disclose about the tomb's initial content and building technology; when was it first looted, or last; where did the archaeologists actually excavate in the 1990s and did they actually reach the initial building level? – are just technical translations of the more difficult dilemmas the team usually had to face when meeting their peers or the public, such as who was/were buried inside, and how can the exceptionality of the monument be explained within the general historical background of Callatis, the western Black Sea, and northern Thrace in general?

To answer as many of these questions as possible, excavations were made at key points inside and outside the tomb, both in previously excavated areas and new sectors, and always after an initial geophysical survey. Emphasis was placed on analysing the construction level of the various elements to establish if a general design was employed at the scale of the entire site, and on understanding whether the tomb was built above or under the ancient walking level – an important distinction for Macedonian tomb types (Stoyanova 2007). As a general flaw in what we have done, we recognize the insufficient exploration of the mound's surroundings, including the western ditch. However, a list of priorities had to be accepted, given the conditions in which many hotspots inside the mound area still await their turn. All the newly discovered walls and structures were immediately covered again with earth at the end of each excavation campaign, but the hope is that a future conservation project will allow them to be investigated under a protective structure.

Documentation, data quality and copyright

The documentation used in the following study can be divided into three categories:

A. Documentation linked in some way to the excavations of the 1990s, and which was available to us before the start of our three-year research project.

This data was represented mainly by (A.1) the architectural dossier, preserved just in printed form, assembled by Anişoara Sion in 1999 as support for a restoration project which was never completed, and (A.2) a set of stratigraphic profiles dated 1995, made by Mihai Ionescu (available in various qualities). The architectural dossier included architectural plans and sections of the tomb, a short text describing the conservation state (six pages), a group of 22 images (of which 10 were made during the 1990s' excavations), and, as an attached annex, a three-page archaeological report signed by Valeriu Georgescu, Nicolaie Alexandru, Robert Constantin and Mihai Ionescu. (A.3) Seven other images, all representing just general views made during the 1990s excavations, were available in small, printed format as part of a presentation poster on the Documaci Mound, exhibited in the 'Callatis' Museum. (A.4) To this we can add only a very low-quality video, dated 1993, made by Romanian Television during the excavations, and the 1994 publication by T. Papasima on the medieval graffiti from the plastered *dromos* walls (Papasima, Georgescu 1994: 223-228).

The architectural survey by A. Sion covers practically most of the relevant conventional representations of the grave, but leaving the socle incomplete (only one face out of the four). The quality of the drawings is remarkable given the conditions when taking the measurements (lantern lightning inside the tomb) and the measurement techniques (alidade and manual measurements for the exterior, most probably only manual measurements inside). However, the purpose of the survey was rather the general geometric description of the structures than the detailed analysis of the building techniques and finishing (although the survey does contain such observations as well). Small differences in block dimensions, orientation of the *dromos* segments, the number of blocks in the walls, and height differences in the courses were noticed. This is why, finally, Sion's drawing was not used in our final documentation. The plan of the extrados of the tomb vaults, and the sections comprising views of the exterior of the tomb in relation with the foundation of the socle, still remain the only data we have about these elements, as they were not examined in more recent excavations.

Except for the architectural survey, which was adequately detailed and allowed verifications, the other data was very hard to locate or interpret. Reading the profiles, preserved only as slightly oblique and partially blurred photographs, was almost impossible before the new excavations, not to mention that the lack of a general excavation plan meant that we did not know where all the trenches were, nor which was which. The same trenches were labelled either with Arabic numerals (on the M. Ionescu material) or Roman (A. Sion), and appeared on differently dated documents. This amplified the initial confusion. After we managed the correlation, we opted to label the old trenches with Roman numerals to discriminate them from the 2017-2019 excavations (Figures 34; 59).

2. Documentation created before 2000 which was identified by our team only recently as the result of networking and archive study.

B.1 comprises the study by the French ancient art historian Alix Barbet and her team, (B.2) the photographs by Teodor Bănică in 1993, and (B.3) the

Table 1 Documentation available to the authors before KALLA project started.

Label.	Data	Date	Creator	Observations
A.1 - Architectural Dossier (Sion 1999)				
A.1.1	*Design theme* for a restauration project – 6 printed pages (text)	1999	A. Sion	Gives information about the conservation state of the monument
A.1.2	10 printed plates (*Planșa 1-10*), printed, scanned – annex of the *Design theme A.1.1* contained 22 photographs, of which 10 were black-white and were made during the 1993-1995 excavation period.	1999	A. Sion	The excavation images show the *extrados* of the tomb, stratigraphy of the mound and supporting walls – west of the socle. They are the best images we have about what was discovered in 1993-1995.
A.1.3.	PL. 1 - Topographic plan of the site (1/1000), printed, scanned	1999	C-tin. Mehedințeanu	Maps 7 other tumuli in the row in which Documaci Mound stands in the western periphery of the ancient city; only 3 trenches were recorded on this plan, without labels. Originally, the architectural plans and sections were labelled also 'Planșa' with Arabic numerals, the same as the images at 1.2; for intelligibility we will refer to the architectural drawings with Roman numerals.
A.1.4	PL. II - Architectural Plan of the tomb's extrados and area covered by the socle (scale 1/50, printed, scanned)	1999	A. Sion	Only three trenches are mapped (SI/1994, SII/1994 and SV/1994); 11 other stone walls are marked and one ditch (labelled 'ritual').
A.1.5	PL. III – Plan of the tomb (scale 1/20, printed, scanned)	1999	A. Sion	Two building phases were discriminated; the plinth at the base of the walls were recorded
A.1.6	PL. IV – Plan (scale 1/20, printed, scanned) – extrados of the tomb's vaults	1999	A. Sion	
A.1.7	PL. V – Section (scale 1/20, printed, scanned) – northern tomb wall, dromoi and socle, including the stratigraphic relation between them as recorded by M. Ionescu in 1994	1999	A. Sion	Has elevation references; includes the entire width of the socle
A.1.8	PL. VI – Section (scale 1/20, printed, scanned) – southern tomb wall, dromoi and socle, including the stratigraphic relation between them as recorded by M. Ionescu in 1994	1999	A. Sion	Has elevation references; included only the eastern side of the socle.
A.1.9	PL. VII Sections of the eastern and western walls of the funerary chamber (scale 1/20, printed, scanned)	1999	A. Sion	Records the supposed limits of the blocks underneath the plasters
A.1.10	PL. VIII Sections of the two dromoi (scale 1/20, printed, scanned)	1999	A. Sion	
A.1.11	PL. IX Section socle – the eastern face (scale 1/20, printed, scanned)	1999	A. Sion	On a small section depicts the entire preserved height of the construction including the foundation.
A.1.12	PL X (scale 1/20, printed, scanned)	1999	A. Sion	
A.1.13	Report (text, printed, scanned), 5 pages	1994	V. Georgescu	
A.2 - Stratigraphic profiles 1995 - M. Ionescu				
A.2.1	Stratigraphic profile east side S2, scale 1/25	11.07.1995	M. Ionescu	Available only as a slightly oblique and partial blurred photography (2011)
A.2.2	Stratigraphic profile west side S2, scale 1/25	11.07.1995	M. Ionescu	Available only as a slightly oblique and partial blurred photography (2011)
A.2.3	Stratigraphic profile east side S3, scale 1/25	5.07.1995	M. Ionescu	Available only as a slightly oblique and partial blurred photography (2011); incomplete

Label.	Data	Date	Creator	Observations
A.2.4	Stratigraphic profile west side S3, scale 1/25	5.07.1995	M. Ionescu	Available only as a slightly oblique and partial blurred photography (2011)
A.2.5	Stratigraphic profile east side S5, scale 1/25	8.07.1995	M. Ionescu	Available only as a slightly oblique and partial blurred photography (2011)
A.2.6	Stratigraphic profile west side S5, scale 1/25	8.07.1995	M. Ionescu	Available only as a slightly oblique and partial blurred photography (2011)
A.2.7	Stratigraphic profile, general view E-W through the mound (scale 1/50)	21.10.1993	M. Ionescu	Available only as a slightly oblique photography (2011).
A.2.8	A.2.7 Redrawn on tracing paper			Included in the presentation poster exhibited in the museum
A.2.9	Stratigraphic profile in the small trench excavated between socle and funerary chamber (available only as redrawn variant in black ink on tracing paper) – south side.	4.10.1994	M. Ionescu	printed, 1/25 scale, scanned
A.2.10	Stratigraphic profile in the small trench excavated between socle and funerary chamber (available only as redrawn variant in black ink on tracing paper) – north side.	4.10.1994	M. Ionescu	printed, 1/25 scale, scanned
A.3	7 colour images printed included in exhibition posters in 'Callatis' Museum	1993-1994	unknown	General views of the site, some details of the *extrados.*
A.4	Video (27 minutes, 720 x 528 px)	28.09 1993	Romanian Television	
A.5	Photos of some of the graffiti published in printed journal Pontica	1994	T. Papasima	Bad quality
A.6	Drawings	1994	T. Papasima	All the representations visible today; some are currently lost.

original hand sketches by Anișoara Sion made during the excavations (1994?), which represented the base for the printed plans and sections included in the architectural dossier of 1999.

Two basic survey documents were made by the French team – a general plan of the tomb and a longitudinal section (faced south), both very much approximated since their single purpose was to provide a general context for the detailed painting survey. Natural scale drawings[2] were made for the coloured panels of the funerary chamber walls. These are simple line-drawings of the panels and the lacunae, or various traces on them, with some basic notations referring to the colour(s) of the panels or decorative elements (Figure 105). Their main relevance for the ensemble of the available documentation on the funerary chamber is that they indicate through precise mapping the preservation state of the pigmented plasters one year after the discovery – and over 20 years ago, respectively. It is, so far, the only complete source on this matter; some photographs also survived, but they would only allow for an approximate estimation.

An architectural proposal for restoration of the monument at the request of the 'Callatis' Museum of Mangalia and the local council, was developed by Virgil Apostol, around 2012, however the authors of this monograph have never had access to Mr. Apostol's materials.

3. Documentation created by the KALLA team and its collaborators, during the project, which allowed, also, the integration and reinterpretation of the older data sets.

Besides the archaeological reports, excavation journals, item inventories, and thousands of high-resolution digital photographs and videos of the archaeological situations uncovered after 2017, we include in this category the results of a variety of interdisciplinary surveys and analyses: topographical data (total

[2] This is not specifically mentioned anywhere in the reports but was deduced from a photograph of the Barbet mission, in which two women are drawing on a transparent sheet of paper fixed and maintained in position by two men on the southern wall of the funerary chamber.

Table 2 Older documentation identified during KALLA project

Label.	Data	Date	Creator	Observations
B.1 – Alix Barbet Report (Barbet 1994)				
B.1.1	Text 3 pages, printed, scanned	1994	A. Barbet	Details about the colours, their arrangement, the conservation state
B.1.2	9 photographs, initially grouped in 4 plates attached to A. Barbet Report (Fig. 37-44, 49-50)	1994	A. Barbet	We obtained the original high-resolution scanned films (2 images with exterior details, 7 images from the tomb's interior).
B.1.3	5 drawings documenting the plastered areas on the 4 walls of the funerary chamber (Fig. 42, 45-48 in B.1.1) with focus on the coloured ones.	1994	A. Barbet, C. Bertrand, P. Foliot, A. Schmidt	Printed, scanned
B.1.4	20 high resolution photographs	1994	A. Barbet	Sent by email by A. Barbet in late 2018; (18 with details of the painted walls of the funerary chamber, 1 with the socle seen from NE, before the dismantling of its eastern side in 1999, 1 exterior image
B.2				
B.2.	4 images	October 1993	T. Bănică	2 exteriors, general; 2 inside the tomb; sent by email by T. Bănică in late 2018.
B.3				
B.3	18 architectural sketches with handwritten notes	1994	A. Sion	Hand-drawn, scanned; the writing can be at times very hard to decipher;

station measurements for relief and archaeological situations – thousands of points), geophysical measurements (3D-ERT, magnetic), LiDAR data, aerial photogrammetry, close-range photogrammetry, 3D models of the archaeological structures and textures, H-RTI for the early medieval graffiti in the tomb, and hand-made drawings of structures and artefacts, digital maps, chemical, physical and microscopic analyses.

On this occasion the older graphic materials (stratigraphic sections by M. Ionescu, and architectural plans by A. Sion and A. Barbet) were digitized, corrected and interpreted, using as anchors the digital measurements: topographic and photogrammetric in the tomb and aerial photogrammetry combined with geophysics and excavation for the documentation which regards the exterior of the tomb.

New contributions, methodologies and aims

Remote sensing and low-altitude aerial photogrammetry

Dan Ștefan and Maria-Magdalena Ștefan

The technological evolutions of the last years, which have made possible bigger propulsion and longer flight times sustained by powerful batteries, the miniaturisation of photographic sensors and mass-production of commercial platforms, have all greatly influenced the way archaeologists document nowadays their digs and sites (Ștefan, Ștefan 2016). Low-altitude aerial surveys with UAVs/drones of the multi-copter type, resulting in oblique aerial images, orthophotographs (geometrically corrected and spatially referenced) and high-resolution 3D models of the land surfaces, have become increasingly common practice, even if the lack of organised training for professionals, or the slow process of amending the local legislations dealing with the flight rights for drones in the case of archaeological landscapes, still raise some issues. This powerful documentation method has been the backbone of the investigations carried out at Documaci Mound, too, allowing not only the integration of archaeological data obtained through excavation in all targeted areas, and of the geophysical survey results, but also the integration of Documaci in the general ensemble of the funerary areas and territory of Callatis.

Aerial images and their further processing into 3D models and 3D surfaces ensured the completion of the general and detail excavation plans, the altimetric analysis of the structures (archaeologically investigated or geophysical anomalies) in relation to the microrelief. In the later phases of the project (May 2019), a LiDAR survey (Figure 29) brought additional information. However, for the detailed study of the microtopography of the Documaci mound, the low-altitude images processed photogrammetrically were preferred, as the resultant DSM ensured a 6-cm/pixel resolution (Figure 57). The UAV survey was done in October 2017,

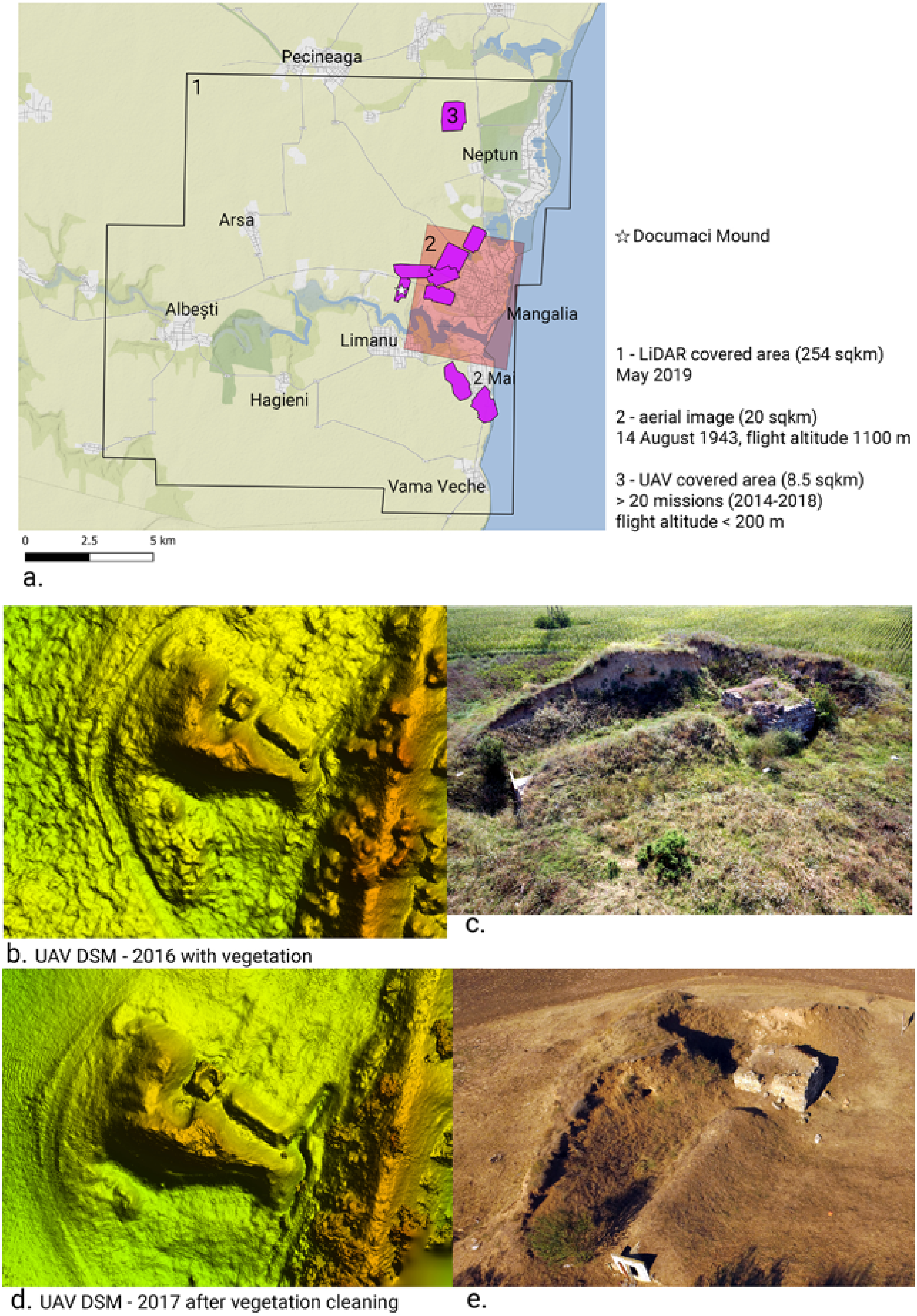


Figure 4. a) Map of areas surveyed with remote sensing methods; b-c) UAV photogrammetry before clearing the vegetation(2014); d-e) after vegetation clearing.

Figure 5. Plan of the site, recorded with portable 3D scanner equipped with a LiDAR sensor.

following a thorough clearing of the vegetation, at the beginning of the KALLA project and before any new excavation was opened (Figure 4/b, d). The analysis of the terrain proved to be essential for the localisation and mapping of the earlier trenches, and also for the identification and delimitation of those areas destroyed in 1993 by excavators. This initial DSM was also the main elevation reference in the analysis of the ERT survey. Orthophotographs of 3-cm/pixel resolution were made for each trench (Figure 37).

Low-altitude aerial surveys (from 50 to 200 m) were done in the area surrounding Mangalia with various UAVs, beginning with 2014. More than 20 flight missions, covering 8.5 km^2 divided into nine interest sectors, ensured the mapping and morphological characterisation of tumuli areas, roads and territorial ancient delimitations (Figures 4/a; 22; 33/a). In the earliest surveys we used a flying platform developed in-house (a multirotor in quad-copter configuration) equipped with a Sony NEX5R (resolution 16Mp). In subsequent years we flew a DJI Phantom 3 Professional (12 Mp), a DJI Phantom 4 Pro Plus (1-inch sensor, 20 Mp), and a MavickPro Air (12 Mp), this smaller copter being preferred for everyday documentation of trenches at Documaci, while the Phantoms were flown especially at those times when the excavations reached major development stages or for the survey of territory (Figures 51 53; 67; 144).

Programmed flights, with targets divided in multiple organized missions, or just free flight for reconnaissance, were employed according to the situation. For large survey areas the resolution for the obtained DSM ranged between 15 and 35 cm/pixel. The georeferencing of the aerial data was ensured with visible markers, measured with geodetical GPS with real time corrections inside the *chora*, while the data recorded during the excavations was measured with total station. Within the site the precision was under 1 cm.

In the case of Documaci, the immediate vicinity of an active military base and the presence of the high-voltage line crossing over the western sector of the mound, as low as 25 m above the ground, constrained flying altitudes and represented supplementary challenges. Mangalia is currently a NATO base for sea fleets and has several militarized points. Even if the enforcing of drone legislation in Romania is not necessarily clear at this point, the team took supplementary precautions when flying and some areas were avoided. The LiDAR survey, which was carried out by a third party, with all the legal requirements fulfilled, covered a surface of 254 km^2, with a resolution of 8 returns/meter and filled all the blank areas, including the forested sectors, with very good results (these will only partly be discussed here).

We used a Zenmuse XT2 Dual Sensor Thermal Imaging Camera, installed on DJI Matrice 200, for infra-red aerial photography of the mound. The flight was made during the night, in June 2019.

Close range Photogrammetry and Highlight Reflectance Transformation Imaging

Călin Șuteu

The overall concept of cultural heritage and the various ways to approach it have nowadays become more and more complex, and, consequently, the operations involved in its research, conservation and restoration imply more and more disciplines of study. Important evolutions have been registered, especially for those aspects of research that involve the digital imaging of cultural heritage, most of them brought together under the broader term of computational photography. These techniques and methods represent an optimal and mainly accessible form of visual survey, bringing forward high-quality and metric accuracy with low costs and time involvement, at the same time also allowing for a significantly easier correlation and interpretation of data. Computational photography can be simply defined as a set of methods and techniques that gather the knowledge provided by several digital photographs in order to create a new representation of reality that offers additional information than that provided by the source photographs on their own. Among the main techniques used by us at the complex site of the Documaci mound were structure-from-motion close-range photogrammetry (SfM) and highlight reflectance transformation imaging (H-RTI). Additional 3D information was also recovered using a blue-light metrological scanner.

Close-range digital photogrammetry has become one of the most important image-based documentation techniques in the field of cultural heritage, especially in the metric documentation of context research (Yilmaz *et al.* 2007) (with products such as orthophotomosaics, digital surface models, etc.), as well as in the long-term monitoring of the conservation state of monuments (Sužiedelytė-Visockienė *et al.* 2015). The photographic documentation at the site of Documaci was done following the rules established by the International Committee for Architectural Photogrammetry (CIPA),[3] the so called 3X3 rules of photogrammetric documentation (Waldhäusl, Ogleby 1994). This also included the essential requirements for colour calibration (using a XRite Colour Checker Classic reference target and subsequent RAW file profiling) and georeferencing. The SfM method was used with three contexts within the mound's funerary complex: (1) the tomb's interior space (funerary chamber and *dromos*, the graffiti panels), (2) the base of a monumental statue, and (3) the 2018 archaeological excavations (S2-S7/2018). Other trenches were documented in subsequent campaigns and in a similar methodology by D. Ștefan, M.M. Ștefan, and Al. Hălbac.

The overall photogrammetric documentation has produced a highly detailed rendering of the contexts that made the subject of the on-going research, thus constituting an important record of the monument's state of preservation (2018). For the archaeological excavations and the monumental statue base the photogrammetric surveys provided a complete and accurate record of the features identified, to the highest metric standards available in the field. Any subsequent 3D documentations done at the site later on could then be used to quantitatively estimate the rate of decay and loss of surfaces, while the comparison of the complete point clouds could yield estimates of the eventual displacements encountered within the monument's structures through time (Bitelli *et al.* 2007). A further development in monitoring the state of preservation through time for the funerary chamber and *dromos* would be the addition of a permanent and continuous micro-climate measurement system (digital thermo-hygrometer with logging function) and seasonal thermal camera surveys from pre-defined station points. In the case of future restoration projects, all the metric documentation obtained so far could be used as a baseline from which to plan the needed operations, with maximum efficiency and minimum efforts.

The creation of a 3D model for the tomb interior (Figure 8/b-e) also opens the perspective for science-based model virtual reconstructions for the entire mound complex, starting from the existing structures (those still standing and those identified so far through archaeological research), and adding relevant information from documented analogies within the epoch from other similar sites in the area. Virtual and augmented reality visits are also now possible based on the current 3D model of the tomb (*dromos* and funerary chamber), especially since opening it to visitors is very likely to have a negative impact on its long-term conservation.

[3] Official webpage at http://cipa.icomos.org/ (December 2019).

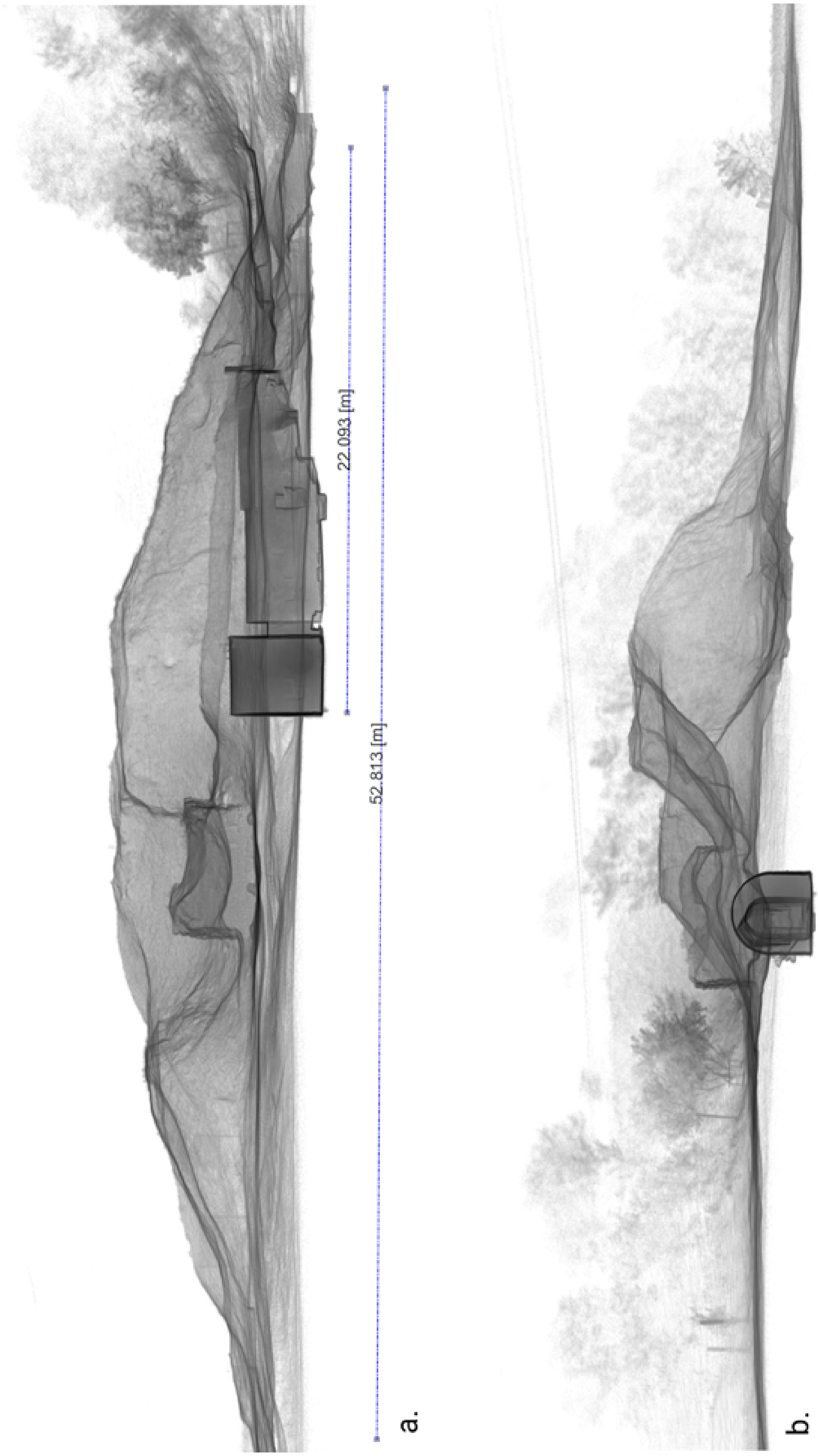
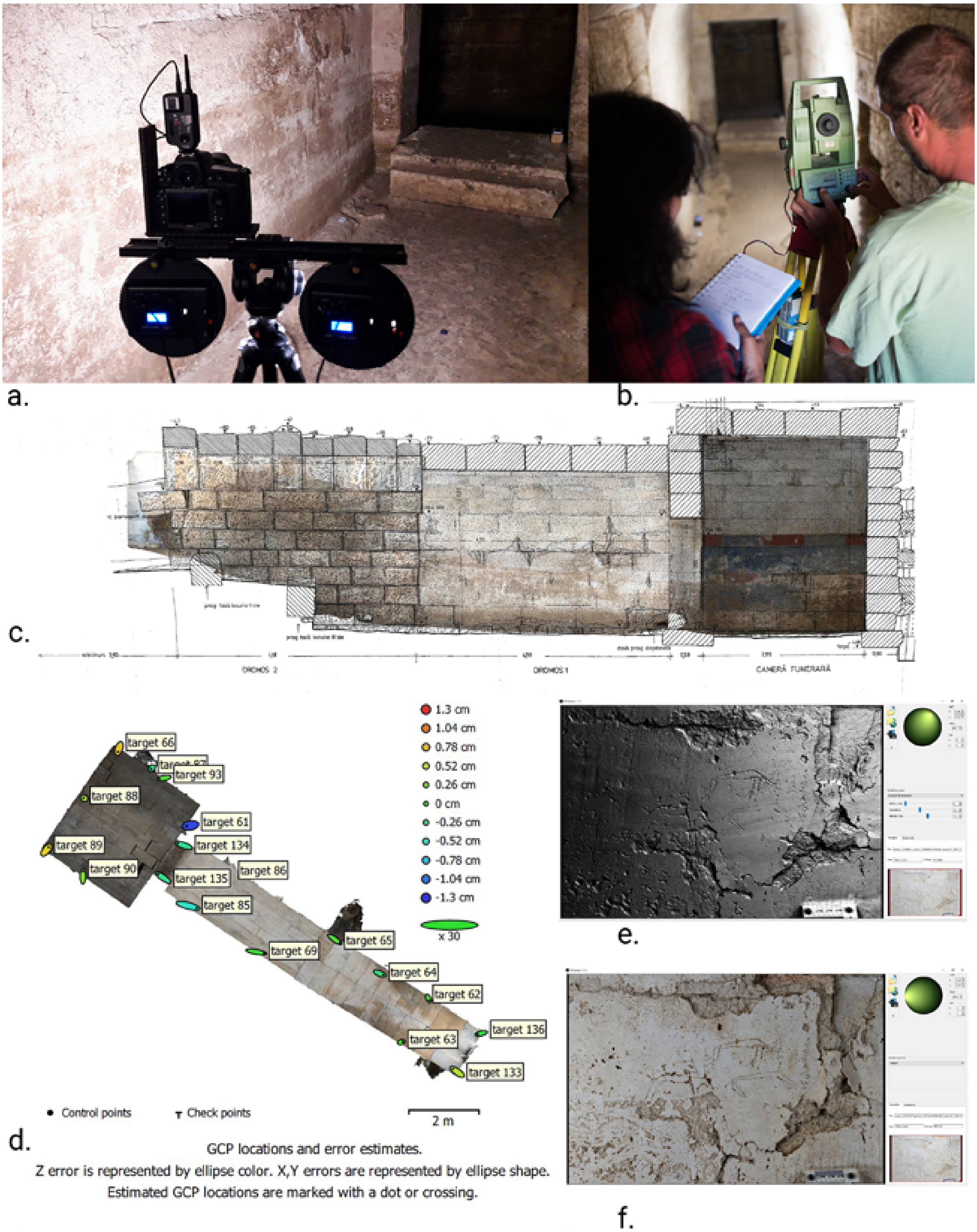


Figure 6. Longitudinal sections calculated on the point cloud recorded with the portable 3D LiDAR scanner: a) W–E; b) N–S.



Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
17	0.812999	0.449976	0.473281	0.929218	1.0428

Control points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Figure 7. Photogrammetry inside the tomb (2018). Instruments and results.

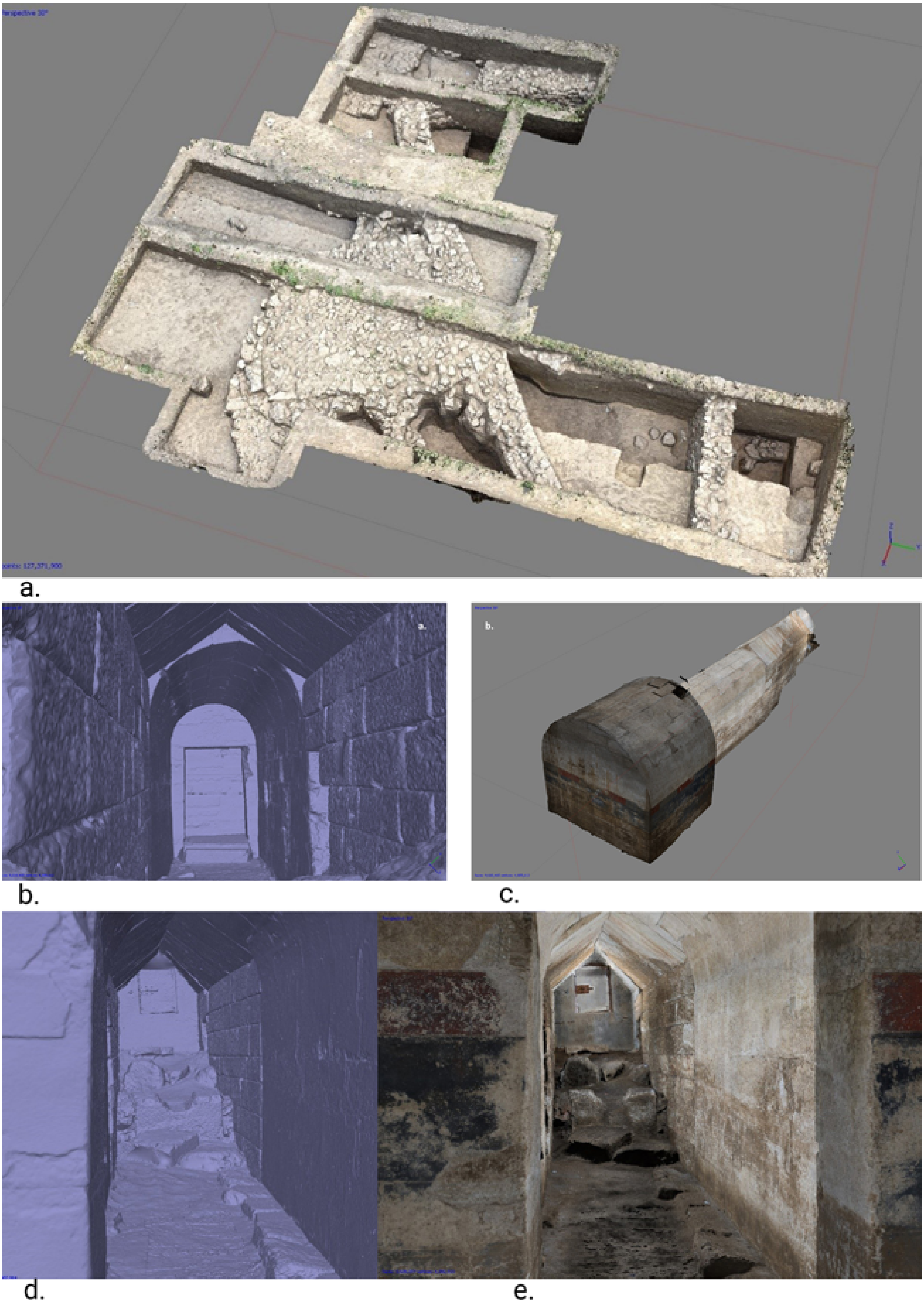


Figure 8. Photogrammetry results (2018): a) trenches in the western sector of the mound (Z3, altar and *krepis*); b-e) tomb interior.

The archaeological excavation (S2-S7/2018)

The SfM documentation of the open archaeological excavation was based on 468 high-resolution photographs taken from close range, hand-held. As a rule, the SfM algorithm requires digital images taken from different perspective points but with a high degree of overlap, in configurations adapted to the surfaces being documented (Micheletti *et al.* 2015). For most of the surfaces of interest the required overlap of nine photographs for each pixel was achieved, with just a few areas missing data, on the embankment and sometimes on the upper (higher) end of deep trenches. An important aspect achieved was choosing the appropriate lighting conditions (diffused light, lightly overcast sky) to avoid deep shadows in the lower, deeper parts of the trenches. For this project, the 17 targets used for georeferencing were non-coded, and the measurements were performed using the total station. The accuracy of the entire project was kept at a sub-centimetre level (total error at 0.67 cm for the entire 156 m^2 area).

Georeferencing in the national system (Stereo70) allowed for a quick integration of all the obtained products (orthophoto and DEM) with the other documentations performed at the site, as part of a complete GIS record. The Digital Elevation Model reached a resolution of 1.65 mm per pixel with a coverage of 3690 points for each cm^2. The obtained datasets were exported into GeoTiff format, both for the Digital Elevation Model (DEM) as well as the georeferenced orthophoto mosaic (Figure 8/a). The amount of high-quality metric data achieved, based on just a 30-minute photographic survey, supports the extraordinary usefulness of photogrammetric recording – in archaeological research especially (Doneus *et al.* 2011).

The monumental statue base (socle)

The now open-air structure of a monumental statue base located at the centre of the mound was also documented, so as to extract metric representations (orthophotomosaics and DEMs) of the wall sides for an architectural study. A total of 125 photographs were collected all around the structure, on two different height levels, and the georeferencing was made in local coordinates, using a coded target scale bar. As the structure was exposed to the open air by archaeological excavations, SfM photogrammetry could be used to compare subsequent point clouds to this initial (reference) survey, thus identifying structural damage and deteriorations over time, until any upcoming conservation and restoration efforts can stop these effects. These measures could be easily applied as part of an integrated monitoring strategy for the entire site, representing, in the end, a form of informational rescue of endangered contexts (Brusaporci 2017).

The tomb interior

For the tomb interior the SfM method was applied using a total number of 574 high-resolution photographs (36.2 Mp), recorded with a fixed 28 mm lens, the focal length being considerate an adequate compromise given the tight confines of the *dromos* and funerary chamber. Since it was quite difficult to illuminate ideally the entire monument for photography, we chose to achieve adequate lighting with an on-camera solution, two LED light sources (with adjustable intensity) deployed alongside the camera, that provided the needed light for each particular camera position. Colour calibration was achieved using a reference sample, the XRite Colour Checker Classic board, while the profiling and corrections were achieved in the RAW post-processing software. To achieve the optimal depth of field an aperture value of f8 was chosen, a low ISO (for reduced noise) and longer exposure times, therefore the use of a sturdy tripod was necessary. With the help of a special sliding rail, with an extension of 0.4 m (Figure 7/a), a set of stereo-photogrammetry pairs were collected, in sequence, for the entire surface of the tomb, resulting in a sufficient and complete overlap (of over nine photographs), thus providing for an extraordinary final model resolution of 0.281 mm/pixel, for the entire researched area of 28.7 m^2 (Figure 7/d). For the purpose of georeferencing the entire project, and to verify the accuracy of the obtained data, a laser Total Station (reflector-less) was used to measure a number of 19 photogrammetric coded targets (12 bits), equally spread around the tomb interior, at ground level, and also on the upper side of the walls (Figure 7/b). The Romanian national reference system was used for the entire project – the *Dealul Piscului* 1970/Stereographic 70 system (EPSG code 31700). The total error registered for this documentation, resulting from the georeferencing process, is very low, at the sub-centimetre level (X=0.81 cm, Y=0.44 cm, Z=0.47 cm) (Figure 7/d). The data sets were processed with the Agisoft Photoscan (v. 1.4) photogrammetric solution, the resulting dense cloud points (using just the Medium quality option) being composed of over 144 million points (144,157,024); based on these a solid mesh was created, composed of 9,605,077 facets and 4,802,914 intersections (using also the Medium option); an 8k high resolution texture was also created for the entire model (Figures 7/c; 124; 126-127; 129-130). The Digital Elevation Model obtained (here a Digital Surface Model – DSM) also reached an extraordinary resolution, covering 1.12 mm with each data pixel, with a density of 7900 points for each cm^2. High-resolution orthographic projections were extracted for the walls and the vaults, using selective sectioning, as required by the detailed architectural study intended. These final products, extracted from the complex 3D model, were also referenced against a set of plans and sections of the monument, created in 1999 for restoration and consolidation purposes.

In a similar fashion, also using SfM, four panels disp laying ancient graffiti (of a later epoch than the burial mound) within the plastered area of the earlier *dromos*, and one on the western wall of the funerary chamber, were documented in high detail, using a local coordinate system. The detailed 3D documentation of the wall surface was made mainly using photogrammetry (with the same settings as those mentioned above) and by means of an Artec SpaceSpider metrological grade blue-light scanner.[4] These five graffiti panels mentioned above were additionally documented using the H-RTI method, see below.

H-RTI (Highlight Reflectance Transformation Imaging)

The H-RTI technique is used in several fields of study, including that of cultural heritage, as it allows for an improved visualization of an object's surface microtopography, using essentially a virtual raking light to reveal even the tiniest details. The method itself involves taking several static images (at least 27), in which the only parameter changing is the orientation and incidence of a light source. All these images are processed and viewed within dedicated software solutions,[5] the results being imaged using an interactive virtual light source and special mathematical filters (e.g. specular enhancement). At the source of this approach are the efforts of Tom Malzbender and Dan Gelb, both researchers with the Hewlett-Packard Labs, who defined in 2001 this new method, then called PTM (polynomial-texture mapping) (Malzbender *et al.* 2001).

The visual analysis of an object's surface can benefit considerably from this new technique of imaging, using the qualitative and quantitative information gathered from a combination of highlights and shadows cast interactively on the surface of the subject, thus revealing its minute 3D texture. Such an in-depth record can infer important information on the actual representation and also on its state of preservation, in this respect allowing for a minute recording of problems such as deformations, abrasions, losses of layers, scratches, holes, cracks, encrusting, corrosive damages, delamination, efflorescence, and many others.

Each of the five panels (Figures 7/e-f; 171-174), located on the plastered walls of the earlier *dromos* and in the funeral chamber, were documented using a number of at least 45 high-resolution photos per position. The photographs were gathered from a fixed position, using a 50 mm fixed lens, while a remote light source (a flash), controlled via a radio system, was aimed at the subject from various angles and orientations. References for colour and scale, as well as the special reflective spheres required by the H-RTI method, were also used within each photograph. These photographs were processed using the RTIBuilder app, the resulting file (*.RTI) being then viewed interactively within the RTIViewer app and finally exported as static image files formats, processed through the Specular Enhancement filter. The full potential of this method can be much better appreciated via the dedicated RTI Viewer software, as it provides an interactive experience for the user.

The fragile nature of these plastered panels, and their poor state of conservation, obliged us to apply this in-depth approach for documenting the graffiti areas. In several areas the plaster is deteriorating rapidly by crumbling and exfoliation, with accelerating loss of information, making our documentation increasingly more valuable for future research.

Equipment and software used

a. Close-range photogrammetry and H-RTI: Nikon D810, Nikkor 28mm, 50 mm, 105mm Macro, Nikon flash SB700, Phottix Pawn radio remote trigger, LED continuous lights, Manfrotto 190 pro, Giottos Slider, XRite ColourChecker Classic, Agisoft Photoscan (ceva de citat) v 1.4.1, RTI Builder, RTI Viewer, Global Mapper v. 19 etc.
b. Structured light scanning: Artec SpaceSpider, Artec Studio 12, Microsoft Surface Pro 4 etc.

Architectural study

Alexandra Teodor

Among the mini chapters presented in this section, those on architecture and stratigraphy documentation were the most time consuming, needing the most onsite observations, revaluation, verification, and 'revisiting'. The main difference between the two documentation types is that the first generally allows proper revisiting (when the architectural structures are not planned to be recovered with earth), while the stratigraphy data is best recorded immediately after excavation, as earth stratigraphy is perhaps one of the most perishable categories of archaeological evidence.

The on-site time spent exclusively on the architectural documentation of the Documaci Mound was unfortunately shorter than the complexity of the situation perhaps required. About 35 days were spent collecting the meaningful architectural data, and undertaking various other related activities, during four KALLA project field campaigns attended (out of the

[4] More technical information is available at www.artec3D.com.
[5] More details about the software used is available here http://culturalheritageimaging.org/ (December 2019).

five that were organized). As well as the present author, occasional assistance was provided by Oana Abălaru (architect, October 2017), A. Florea (architecture alumna, 2017), and T. Bănică (architect, October 2018). In the early stages of the field investigations the architect A. Sion was available on occasions to discuss her observations and recordings. Several on-site discussions were also held with Valentina Cetean, regarding the stone structures, during the first campaigns. Oana Comănescu was invited in 2018 to evaluate the technical conservation state of the plasters inside the tomb.

In the latest campaign (October 2019), technical support for various measurements was provided by the Polish archaeology students and PhD students who were completing their training at Documaci under the supervision of Prof. Tomasz Bochnak from the University of Rzeszów. The present author was responsible for the basic topographic recording of the geometry and levelling of the stone structures revealed by the current excavations in October 2017, and partially in May 2018, with the support of Alexandru Halbac and M. M. Ștefan. Part of the campaign in May 2018, and the two October ones of 2018 and 2019, were dedicated to the architectural study of the Documaci tomb and socle.

Although the brevity of the architectural campaigns called for strict priorities in terms of what was to be documented and how much detail drawn, the on-site reality was different. Priorities were in fact established every day based on the several factors which influenced the ongoing documentation: the overall necessities of the team in terms of people and equipment; the discovery of significant structures in the new excavations, which needed immediate recording to allow the dig to progress; the availability of artificial light (for the tomb interior); the number of people assigned to work in a certain place, etc. (e.g. during the excavations inside the tomb the architectural documentation was significantly hampered).

In terms of immediate availability, two types of architectural structures required documentation: those that were newly (re)excavated and which most of the times were re-buried within the same campaign for best conservation purposes (thus they were considered structures with limited availability for documentation); and those structures which were generally excavated in the 1990s, and since then were awaiting more detailed documentation (which were considered structures with higher availability for documentation).

A. Structures with limited availability for documentation

These consisted of the various stone structures uncovered in the (older or the new) archaeological trenches: all were categorized as either ring walls or the so-called support walls of the earth mound (see description in Chapters 5 and 6.3)

The architectural recording of the structures with limited availability for documentation was somewhat basic, consisting of the following types of data: (1) the geometrical/topographic recording using a total station with visible laser. According to each situation, the measurements sometimes meant just recording the level and contour of the walls at their base and the preserved elevation (width, length, height as contours), but at other times more detailed digital drawing was preferred, and a stone by stone recording strategy was considered necessary; (2) photographic documentation was obviously always present; (3) 3D data and textures collected from close-range photogrammetry was applied on images collected at ground level or from the air with UAV (this set of data was accomplished by Călin Șuteu). In addition, the structures were hand-drawn by archaeologists at various scales, usually 1/10 or 1/20.

B. Structures with higher availability for documentationThese were the constructions of the tomb itself and the socle, both uncovered in the 1990s (see descriptions in Chapters 8 and 7).

The architectural recording of the structures with higher availability for documentation was complex and unexpectedly challenging. The tomb extrados was not available for study, while its interior, dark and unventilated, required the employment of artificial illumination and a certain organized approach to documenting the small space and using the measuring instruments. The visual observation of the vaults demanded the use of ladders and pin-pointed flashlights, while always taking great care not to harm the plasters. Needless to say, some of the stone block joints, covered by plasters, had to be deduced. Measurements with infrared camera were attempted inside (without initial heating or use of flash), especially targeted to identify hidden block joints, however the uniform high humidity within the walls and plasters allowed no relevant results.

Even though we were lucky enough to have access to the architectural plans of Anișoara Sion (made in 1999 and based on the 1993-1994 observations), and then even luckier to discover the sketches of A. Barbet (thanks to Teodor Bănică, who told us about her studies), we started from scratch some of the measurements and architectural investigation of those segments still available to us, with the intent, subsequently, to integrate with and verify the older data, while still using them as different layers – each having its own contribution to make, while the older also retained historical load/value.

While some of the recordings were meant for necessary routine documentation, the most fruitful approach, in terms of new results, was obviously the one based on direct on-site observations, which is also – by no coincidence – the most time consuming. The partial and the integrated results will be presented, with detailed methodology, in the relevant sections below or in future publications. The recording methodology of these observations was established over time, once the study progressed, and consisted of several attempts until a satisfactory workflow was identified. No existing formula (if any are available) was applied, however some principles were constantly pursued:

Extensive *rough data collection* made on a detailed and precise as possible visual support. It is an objective approach (as much as possible), meant to ensure at any time a complete re-evaluation of the structures, regardless of their physical availability.– Systematic *data interpretation* on several key-topics (stone block disposition within the walls and construction details, furniture placement and configuration, plaster conservation/alteration, etc.). It is a subjective approach, made in an attempt to achieve a wider and better (compared to the current) understanding of the monument and of the ensemble to which it belongs.

For the tomb, the data recording consisted of general topographic geometry and detailed geometry for some particular elements; photogrammetry (C. Șuteu); detailed onsite drawing on vectorised photogrammetry (partial); onsite notes and punctual measurements, with detailed photographs. This data set is opposable for comparative analysis (although not entirely) with older drawings, photographs and notes made by A. Sion, A. Barbet, and others.

For the socle the data recording consisted of detailed geometry of the blocks acquired by total station, photogrammetry (C. Șuteu), and notes on the configuration of the blocks. This data set is opposable for comparative analysis (although not entirely) with older drawings and photographs made by A. Sion, and others.

The most important results of the architectural research one can mention are the identification of some construction details previously ignored (such as the T-shaped blocks used as interconnecting elements between funerary chamber and *dromos* (Figure 126), the red ochre construction lines identified in multiple places inside the tomb (Figure 104), and the interpretation regarding the possible furniture elements inside the funerary chamber, as well as their correlation with the painted plaster (see Chapter 8.4.1)

Only a part of the recorded data is illustrated and published in this present volume.

Classical and digital stratigraphy

Maria-Magdalena Ștefan, Florentina Marțiș, Alexandru Halbac

In the case of the Documaci site, the activities of documenting and interpreting stratigraphy were divided into two categories: the first was the *in situ* documentation of the newly discovered structures and contexts, during the time of the 2017-2019 excavation campaigns, while the second involved the revaluation and interpretation of the few available drawings with stratigraphic content made during the 1993-1995 archaeological campaigns.

All the new trenches were documented using four methods – aerial imagery, close range photogrammetry, topographic measurements and hand-drawn sections – each being suited for the recording of certain features (either texture but not volume, spatial relations but not textures, 3D correlations, etc.), being at the same time characterized by different precision limits. The description of the ancient structures in Chapters 5 and 6 have taken into consideration an integrated analysis of the data originating from all these sources.

The topographic measurements were recorded in absolute coordinates (Stereographic 1970, Black Sea elevation system), using a reflectorless total station and a unitary network of reference points for the entire site. Thousands of points organized in several tens of working sessions had to be processed, interpreted and categorized thematically. The initial coordinates of the reference points were stablished with geodetic GPS and real time correction. We recorded thus (with visible laser or reflectors) all the masonry elements (walls, pavements, stone debris of partially dismantled walls), the fragments of pottery or tiles, charcoals, elements of stratigraphy (layers), but also the axes used for the manual drawings or the photogrammetric markers. As often as possible the detailed approach to topographic recording was employed, based on tracing the contours of stones and building blocks as individual 3D elements with categorized coding.

The topographic measurements were preferred for the intrinsic analytic value of the digital drawing, which even if simplified and geometrized in aspect, therefore not necessary 'pretty', has, nevertheless, the potential to project in a unitary model a complex situation divided into many sectors. The hand-drawn sections ensured the aesthetic of the illustration, and, above all, the immediate interpretation and correlation of the stratigraphic situations. During 2017-2019, 46 hand-drawn sections or perspective views were made at scales of 1/10 and 1/20. The originals are archived in the Institute of Archaeology in Bucharest.

The processing of the older documentation implied the digitisation of the older stratigraphic sections, having in mind their correlation with the site plan as now known (Figures 36; 59), the results of the new excavations and of the geophysical survey (Figure 9). We worked with certain difficulty with the six profiles dated 1995 and signed M. Ionescu, describing the excavation long sides of S2, S3 and S5 from 1995, which were available to us only as oblique, low-quality, slightly blurred photographs of the original hand-drawn documents. Clearer data were available for the 1993 main profile (Figures 60/b; 63) and for the SV/1994 (Figure 80/a) – which were both later redrawn in ink. Based on using deduced elements as actual terrain morphology, as well as the elevation details of the socle and tomb, we advanced the most probable proposals as to where exactly these profiles can be placed on the site's plan and how they can be correlated with the general stratigraphy we actually excavated (Figures 62; 81). Some proportions or dimensions of these interpreted drawings can be slightly altered, even if geometric corrections were always made. The colouring was selected to best fit the text description given by Mihai Ionescu, which only identified a shade. Consistency of colouring was aimed in relation to the logical nature of the strata. Other information was extracted from A. Sion's architectural sketches (1994) and integrated in composite representations, mixing projections of structures from different plans to enhance and illustrate the stratigraphic correlations (Figures 60/b; 63).

The architectural and topographical surveys of the funerary ensemble were complemented in the final stages of the project by recording a high-density point cloud, using a portable mobile mapping system (MMS) by GeoSLAM, i.e. a portable 3D laser scanner using a Velodyne LiDAR with 16 laser beams/sensors, capable of emitting/recording 300,000 pulses/sec., up to 100 m range. The 2D laser profiles were aligned through a 3D SLAM (simultaneous localization and mapping) algorithm (Gautier 2019; Nocerinor *et al.* 2017). As a result, a 3D point dense cloud of the scene was generated based on the time-of-flight (ToF) algorithm to resolve distance and the 'six degrees of freedom' (6DoF) of the sensor head motion. The equipment and associated technology and processing software was available to the research team just for the last year of research, providing, after processing, 3D geo-referenced models of the architectural structures and associated floor plans and vertical/horizontal sections (Figures 5-6; 136).

Geophysical study of the funerary ensemble

Dan Ștefan, Alexandru Halbac

Given the poor state of the available documentation from the older excavations of 1993-1995, it became clear for the new research team that a geophysical investigation might be the best solution to recover and interpret information, in the context in which a complete reopening of the old trenches was impossible. Moreover, the results of the geophysical survey became the primary guide for the new excavations, offering, as well, the most complete image of the funerary ensemble plan, on which the overall architectural analysis could be anchored.

The geophysical investigations at Documaci Tumulus were designed and conducted both in the area initially covered by the embankment and in its vicinity. Several methods were tested.

At the beginning, a large area (2 ha) was prospected using magnetic susceptibility measurements recorded in a non-systematic manner, further on interpolated to get a regular grid. For this prospection, a portable SM-30 k-meter from ZH Instruments and a MS2D field sensor coupled with a MS3 k-meter from Bartington were used. The obtained magnetic susceptibility map (not shown here) emphasized lower values (in the range of 500-800 x 10^{-6} SI) for the remaining embankment, as with the surrounding depression/ditch located to the west. These values were lower than the soil matrix measured outside of the anthropically affected field (in the range of 1000-1500 x 10^{-6} SI). The lack of sediments enriched with iron oxides of organic origin should explain well the lower values recorded along the site. In fact, after the levelling of most of the mound by heavy machines the remaining part of the embankment consists mostly of the pure rock (loess) used by the ancient builders to heap the artificial hill.

In the second stage of the geophysical exploration, a preliminary assessment proved that the levelled surface initially covered by the Documaci mound exceeded by far the contamination threshold required for a relevant magnetometrical investigation. Despite this, for some areas (6400 m^2), in the immediate site vicinity, the vertical gradient of the magnetic field was measured and recorded using a Grad 601-2 dual sensor magnetometer from Bartington. The results of magnetometry did not reveal enough relevant results, due to the use for many years, after 1995, of the mound and its surroundings as a rubbish tip, for both domestic and construction debris. Numerous metallic wastes, concrete and brick fragments, electrical cables, even faience tiles, etc., have polluted the vegetal soil layer, despite team efforts to clean the terrain surface. The

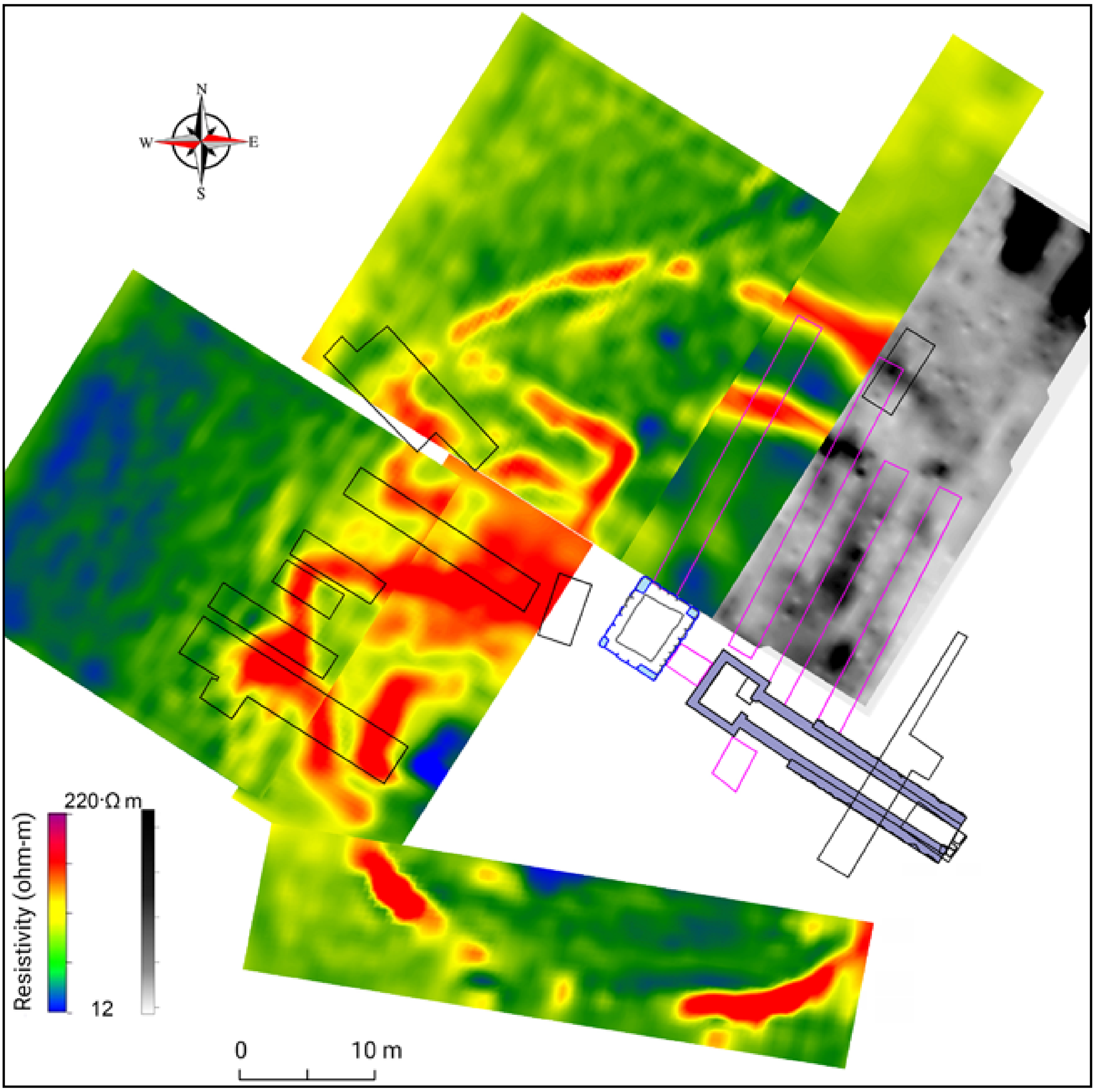


Figure 9. Map with results of the 3D ERT investigation (2018), a slice at a depth of 60 cm (colour scale), and the lateral mapping (2014) results for a depth of 1 m (black and white map).

disastrous effects on the archaeological heritage and the environment of the uncontrolled dumping of waste all around Mangalia, are direct consequences of the unregulated development of the territory as a seaside resort attraction during the post-Revolution years.

Finally, given the mound's state of destruction by heavy machines, and its intense contamination with modern waste, the subsoil investigation by electrical methods was considered as the most suitable and potentially efficient. After an initial measuring session using lateral mapping on a test surface, a large-scale tomographic investigation of the site (ERT - Electrical Resistivity Tomography) was designed to obtain 2D imagery and 3D representations of the remaining under-mound structures. The ERT was carried out with a Lippmann Earth 10 W resistivity meter, equipped with a switching system and 64 active electrodes, which is also insensitive to modern surface waste.

The surface to be examined by electrical tomography (Figure 9) proved to be too large and complex in shape to be embedded in a single measurement grid. In addition, some areas covered by protective membranes over exposed walls and excavations were inaccessible for electrode implantation. However, it is known that electrical tomography can still be used with good results in the case of data acquisition in a non-systematic manner (Tsokas *et al.* 2018). Under these conditions, we decided to investigate the site through an irregular network of rectangular surfaces suitable to cover most of the funeral ensemble. In each of these rectangular surfaces the electrical tomography data was collected along parallel profiles; following this the data thus collected will be combined for 3D interpretation in the manner already well known and reported (Loke, Barker 1996). After some preliminary tests, an optimal distance of 1 m between the measurement profiles was established.

In 2017 (October) and 2018 (May) we managed to survey an area of 7000 m^2 along 70 parallel measuring lines (profiles), 30 or 60 m in length. The interval between the measuring lines was also 1 m. The penetration depth was a maximum of 4 m. The fact that the embankment was already mostly levelled by machines in the areas surveyed made achieving greater depths unnecessary. It was, in fact, quite a surprise that, even in those areas heavily affected by machines during 1993 events, the bases of several stone structures still survived and were observable in the ERT data.

Between the various widely used electrodes configurations the dipole-dipole was selected due to increased sensitivity to horizontal changes in resistivity (Loke 2000). This option proved to be the right one after comparing the preliminary results of some ERT test profiles where Wenner, Wenner-Schlumberger and pole-dipole arrays was also used. Between the four electrode arrays, the results obtained after the processing of the data collected in dipole-dipole configuration favours most the single layered oriented character of the built structures distributed under the remnant of the tumulus embarkment.

All the electrodes were individually recorded by GPS with real time corrections or by total station measurements. The data was assembled in 3D, available for multiangle visualisation, horizontal or vertical slicing, measuring of depths, various sizes, etc. Despite the splitting of the measuring sessions between seasons – a traditionally non-recommended practice, but which was unavoidable in our case – the results remained consistent. During the surveys, the soil humidity was moderate. The resistivity values were measured in a dipole-dipole configuration. The data were processed with ZondRes2D and ZondRes3D software.

The main result of the survey was the particularly good discrimination between the limestone structures (dry masonry walls and their rubble, stone slabs platforms) and the loess embankment. Pinpointed excavations verified in several sectors the 3D-ERT results and the confirmation was reliable. The electrical method proved to be well suited for the geological features of the Documaci site, becoming thus the main guide for the engaged new excavations.

Geological assessment

Valentina Cetean

The geological documentation followed a broad range of topics specific to geoarchaeology, covering from stone block type (Figures 162-164), construction techniques, size and type of chiselling tools used by the ancient masons working in the Documaci tomb (Figure 150), to the general geological setting of Callatis *chora* and identification of possible ancient quarry sites (Figures 166; 165). A separate direction, focusing on the investigation of the pigments and plasters in the funerary chamber, was completed in parallel with the study by our Bulgarian colleagues. The results of the two analyses will be presented separately in further chapters.

The main geological objectives related to the Documaci mound archaeological site included the following stages and actions:

a. Documenting points of interest regarding elements of geology, geomorphology, hydrology, climate, soil, etc. in the mentioned area.
b. The petrographic and mineralogical characterization of the variety of stones identified within the archaeological site of the mound, by looking at different aspects of the stones used inside the funerary complex (masonry blocks of the funerary chamber, *dromos*, floors and vaults), sized stone used for other structures included in the embankment, assessment of the lithic items found in the archaeological sections, as well as other fragments of masonry or various stones found on the surface in the site area.
c. Site catchment analysis and identifying the potential source areas of stone used for the building of the various structures identified under the mound.
d. Analysis of the techniques of stone processing by pointing out stone blocks selection process and dimensioning, the workability degree of stone, preliminary process (grooves carved in stone, support holes, bevel cutting, decorative embossing) along with elements of stone finishing (blocks and tiles), as well as other characteristics regarding the tools used for processing.
e. Description of the state of stone conservation by inspecting the physical degradation caused by the effect of exogenous factors (precipitation, sun, freeze-thaw cycles) on the components of the external masonry, as well as the study

of chemical alteration of the exposed stone. In addition to this, the study followed the durability of the stone components from inside the funerary complex due to direct and indirect humidity (infiltrations) below the ground, as well as the compression load and bending under the weight of the monument and walling structures itself.

f. Defining the plaster and mortar from inside the tomb through mineralogical investigations, together with the descriptions regarding the physical and chemical properties that can be detected.
g. Optical and electronic microscopy analysis of the layers of paint from the walls inside the tomb.

The archaeological research applied at Documaci involved a preliminary stage of preparation from a geological point of view that was followed by several stages of field research. Laboratory research, specific documentation, as well as specialised interdisciplinary interpretation and correlation were carried out between the archaeological campaigns undergone at Documaci.

The available scientific literature from open-access sources and specialised institutional archives, including previous geo-archaeological research regarding other sites present on the eastern shore of the Black Sea, was used for a general description of the region or perimeter. The useful elements were selected and processed according to the objectives of this project, while using the methodology present in the scientific area.

Mapping, sampling and laboratory analyses were conducted over two years, during three archaeological campaigns. At the Documaci funerary complex, a preliminary assessment of the samples with a binocular magnifier was carried out on-site. This allowed a more efficient selection of samples to be taken to the laboratories. Prospecting and samplings from the Callatis surroundings, e.g. Limanu and Albești, were also undertaken. All the samples were included in a database enhanced with images and descriptions.

The field observations were carried out both inside the funerary assemble, as well as on the currently dismantled pedestal and the archaeological sections as they were researched. The visual appearance of the stone elements, the working-size of the stone blocks, the base structure of the buildings, and the processes of alteration/degradation inside and outside were noted. Also, a general survey was carried out regarding the potential sources of stone. In addition to these activities, all points of interest or petrographic categories were sampled.

In 2017, a preliminary petrographic analysis and informal descriptions were prepared on 21 samples of limestone selected from the rocks outside the funerary complex, one stone sample from the interior, made available by the archaeological team, four samples of mortar/plaster (two of which had pigment/paint) and nine limestone samples from the Limanu quarry and eight clay samples from archaeological section S1-2017.

The detailed mineralogical-petrographic description with the polarizing optical microscope was made in 2018 on ten samples from the mound site (eight limestone and two mortar/plaster samples from the funeral chamber) and five samples from the stone quarry at Limanu, confirming its Sarmatian age and the type of deposits that most probably form the source area of the stone blocks and flagstones found within the funeral complex.

From the 40 samples collected in 2018, we made 18 thin sections, 12 being limestone samples taken from the excavated archaeological sections and six from the fortress of Albești and the neighbouring valley.

In addition to the binocular magnifying glass used on-site, the general physical observations of the samples (limestone, mortars, pigments, other mineral fragments) were made in the Microcosmos Laboratory of Romania's Geological Institute. Among the specialized equipment used, was a Zeiss STEMI 508 stereographic microscope, magnifying power up to 50x (10x eyepiece, and lens from 0.63x to 5x), equipped with a Zeiss digital camera.

A Zeiss-Jena Jenapol optical microscope was used for mineralogical identification and characterization under polarized light made on thin sections (rocks, mortars), as well as a Zeiss AXIO IMAGER A2m optical microscope, with a magnifying power up to 500x and equipped with four lenses with different levels of magnification (i.e.10x, 20x, 40x and 50x), and eyepieces with 10x magnifying power, also equipped with a Zeiss digital camera.

The electronic microscopy and pointed chemical composition were performed with a Hitachi TM3030 Tabletop Scanning Electron Microscope (SEM) with a zooming index from 15 to 30000x (Digital zoom x2, x4), equipped with BSE and EDX detectors and 15kV Accelerating Voltage.

Thus, following *in situ* observations and sample collection from repeated participations in the mound's excavation campaigns, a total of 66 thin sections were made and analysed in the laboratories of the Geological Institute of Romania (Bucharest). Half were fully optically described and constituted the scientific support for the geological descriptions and mineralogical-petrographic classifications presented in the monography, the current chapter, and other independent chapters. The other samples are yet to be analysed and will feature in a future article regarding the limestone types.

Chapter 3
Broader Context

Callatis in the 4th-3rd c. BC. A political player on a secondary stage of the Diadochi Wars

Livia Buzoianu, Maria-Magdalena Ștefan

The historical sequence selected here for further detailing corresponds to the chronological interval in which the cemeteries of the ancient city exhibited their greatest extent, the earliest mounds were built[1] and the *Documaci* mound finds its references and historical context. The 4th-3rd c. BC represent a fairly well documented period in what concerns the written sources (historical) mentioning Callatis, and also the dating interval for some of the most consistent ensembles of archaeological data from the city's long existence.

Of the very beginnings of Callatis, either at the end of the 6th c. BC (Avram 1999: 9-11; 2007: 244-246), end of 5th c. BC, or just in the beginning of the 4th c. BC (Hind 1998: 139), we will not debate here, as some valid arguments may be cited on each side. However, if an early foundation was to be taken into consideration, we should emphasize the fact that the historical references to events that happened at that time in the western *Pontus Euxinus*, such as the Darius expedition of 519 BC (or 514-513 BC; Alexandrescu 1986: 28) against the Scythians, did not mention Callatis, or are, at most, uncertain, as with the list of cities tributary to Athens in 425-424 BC. In the first case, only Apollonia Pontica and Mesambria[2] were mentioned, while, for the second, a restitution as Κά[λλατις] instead of Κα[ρκινῖτις] is still regarded with restraint by the city list editors (Avram 1999: 10-11; 2007: 246). With the exception of some pottery fragments, allegedly identified in a pit, recently reported but not illustrated (Pâslaru *et al.* 2014), practically no vestiges have been uncovered in the ancient city which can be dated before the 4th c. BC. The situation has lately changed for Callatis *chora*, where, in the vicinity of the Hellenistic fort of Albești, a good deal of what can already be considered a consistent agglomeration of pre-monetary signs and early Istrian bronze coins of the 'wheel type' have been revealed, mostly during treasure-hunting activities (Talmațchi 2018). They remain for the moment hard to interpret in the absence of other types of contemporaneous materials. The rather distant position from the sea makes the cataloguing of their site of discovery (about 10 km west of the Hellenistic Dorian colony) as an initial Milesian settlement quite problematic. Nevertheless, the more diverse archaeological finds from the 6th c. BC at Shabla Cape, 18 km south of Mangalia, were interpreted by some as having the potential to allude to the possibility of a two-step foundation – with an initial Milesian colony at Shabla, followed by a later Dorian reestablishment on the actual site of Callatis (Oppermann 2004: 16-17).

References to Callatis are also missing in relation to more recent major events, e.g. the military campaign of Philip II against Atheas, in 339 BC, or that of Zopyrion against the north-Pontic Scythians – actions which marked the settling of the Macedonian authority in the western Black Sea. Quoting historian D.M. Pippidi (1984: 157), 'the intent of Philip was to ensure the entire control of Thrace, from the Aegean to the mouths of the Danube. The control of such a large territory had to start with the Greek city-ports on the western Black Sea and this is how the relations he had established with them can be explained...' It should be understood that Philip II had entrusted the supervision of the area to a governor – Zopyrion – identified in the later sources as *praefectus Ponti* (Trogus Pompeius XII 2, 16) or *praepositus Thraciae* (Curtius Rufus X 1, 43).[3] Set up by Philip II, the Macedonian authority was maintained under Alexander the Great and Lysimachus. This may be argued by taking into consideration the titles of Zopyrion and the existence of Macedonian guards in the Greek cities at the start of Callatis' insurgence against them.

This is, in fact, the earliest recording of Callatis in the ancient written sources as a participant in a majorpolitical event – the uprising of the cities of western Pontus, led by Callatis, against the Macedonian ruler of Thrace, Lysimachus, at the end of the 4th c. BC (Avram 1999: 22-24; 2007: 258). The unfolding of these events was related by Diodorus of Sicily (XIX 73, 1-3).

[1] For the history of Callatis city, see Preda 1968; Georgescu, Lascu 1995; Avram 1999: 3-198; 2007: 230-286.

[2] Herodot IV, 93; the Greek historian referred to the Thracians who inhabited the lands located 'up to Apollonia and Mesambria' (ὑπὲρ Ἀπολλωνίης τε καὶ Μεσαμβρίης πόλιος οἰκημένοι).

[3] For Zopyrion, see Iliescu 1971: 57-73; Suceveanu 1972: 89-101; Pippidi 1984: 157-158; more recently on archaeological evidence for his campaign in western and northern Pontus, see Avram *et al.* 2013: 227-304 (especially 249-258).

Figure 10. Archaeological discoveries in the larger region of north-eastern Thrace during the late 4th-3rd c. BC.

This period of political and military unrest caused by the attempt of the Greek cities to terminate the regime of the Macedonian garrisons and regain autonomy can be dated throughout 313-309 BC. Hostilities advanced in two stages – initially in 313 BC, at the instigation of Antigonus *Monophthalmus* who supported the push by Callatis for autonomy, including with its own coinage, in the context of the so-called 'third war of the successors', in which Ptolemy, Cassander, Seleucus and Lysimachus opposed Antigonus the One Eyed; the Diadochi peace of 310 BC temporary terminated these clashes, only for them to be resumed the next year, following the manoeuvrings of Ptolemy I Soter.

After expelling its own Macedonian garrison in 313 BC, Callatis aided Odessus and Istros to succeed in similar endeavours. As Lysimachus stormed north, in an attempt to regain control, a local alliance (*συμμαχία*) of Greek cities was established, to which the 'neighbouring people of Thracians and Scythians' were rallied as well (Diodorus XIX, 73,1-8). The hoard of ten staters found at Gâldău (Călărași), on the left Danube bank, not far

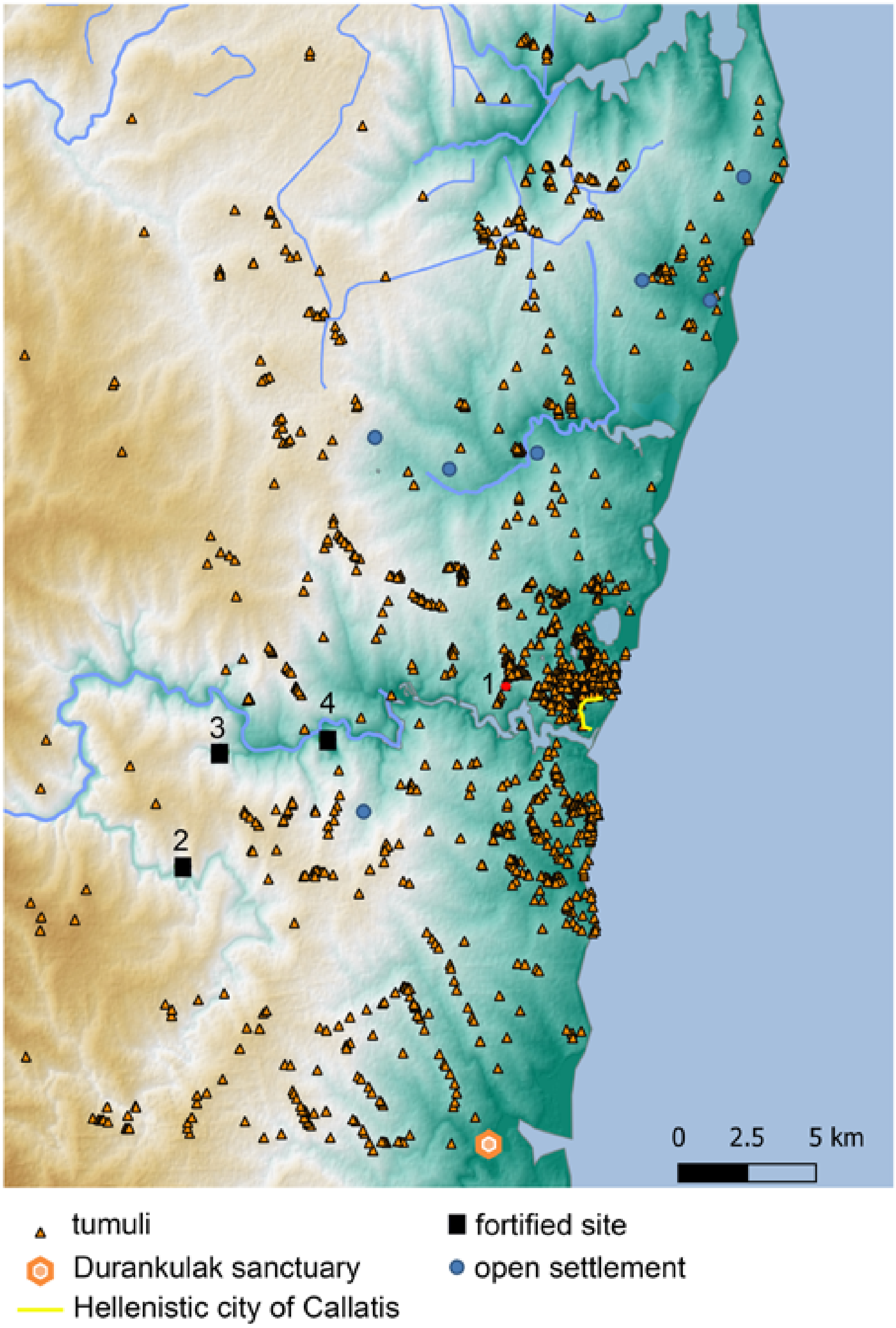


Figure 11. Sites in the territory of Callatis (4th-3rd c. BC): 1) the Documaci Tumulus; 2) Coroana; 3) Albești; 4) Hagieni.

from the indigenous fortress of Satu Nou, had its latest coins dated in the intervals 323-315 BC and 319-310 BC, originating from minting workshops located in Cyprus and Asia Minor controlled by Antigonus *Monophthalmus*. It may be thus placed in this context of war payments in gold coin, from the west-Pontic cities funded by Antigonus, to a local warlord, during the period of the revolt (Vîlcu 2015: 195-196). In the first stage of the conflict, Lysimachus regained control over Odessus and Istros by siege and political agreements, while the Thracians were scared into betraying their allies and the Scythians were defeated in battle. Several hoards found in north-east Bulgaria (Rousseva 2002: 501-512), with closing dates in the last two decades of the 4th c. BC, reflect the competition for power of the Diadochi, expressed also through bribing chieftains or securing military aid in the territories of the Lower Danube, through the mediation of cities like Callatis and Istros (Petac, Niculescu 2018).

After the fall of Odessus and Istros, a siege was then enforced upon Callatis, who, as lead instigator, had to be severely punished. Meanwhile, Antigonus' forces pressured Lysimachus by advancing in key positions towards Thrace: a fleet led by Lycon aided Callatis[4] and a land army under the commander Pausanias camped at Hieron, north of the straits (Diodorus, XIX, 73, 6). Prioritizing, Lysimachus held back a section of his army to continue the siege of Callatis, while he left with the largest part of it to face Pausanias and the rebellious Odrysian ruler Seuthes, also supported by Antigonus (Diodorus, XIX, 73, 8), and he defeated both separately. By swift counter-attack he thus succeeded to undermine Antigonus' strategy, who was preparing to invade Macedonia with a large army. Antigonus would have benefitted greatly if Lysimachus were to be detained north of the Balkans, or, even better, defeated. Therefore, his encouragement and funding of a consistent concentration of forces (Pausanias, Lycon, Seuthes, Callatis and her composite alliance) to encircle and engage Lysimachus appears well planned. It is not clear how the siege of Callatis ended. Even if the peace treaty of 311 BC stated that all Greek cities should be free, the mention by Diodorus (XX. 25) of 1000 refugees from Callatis received by the Bosporan king Eumelus[5] (r. 310/309 BC-304/301 BC) in the settlement of Psoa, may suggest, however, that hostilities against Callatis, and repressions over some of its citizens, continued for a while. The date of the city's Macedonian conquest after the second siege, which in 309 BC was still ongoing, has not been determined. A date close to 309 BC may be taken into consideration. Vîlcu (2014: 99; 2015: 196), on the other hand, highlights the potential of the so-called Dobruja 1954 Hoard (IGCH 796) of 40 staters, with the latest coins dated during the fourth war of the Diadochi and minted in Babylon, to indicate the date of the Macedonian defeat of Callatis after the second siege could be after 307/306 BC and before 304/301 BC.

It is highly probable that Lysimachus left a garrison in the defeated city, as he did at Odessos, still under his control in 302 BC (Diodorus XX, 112, 2).[6] We also do not know whether the city was obliged to pay tribute or if it maintained its democratic rule (Avram 1999: 25; Pippidi 1984: 162-163).

Even if the chronology of the unsuccessful campaigns by Lysimachus, and possibly also those of his son Agathocles, in north-eastern Thrace against Dromichaetes (Diodorus XXI, 11-12; Pausanias I, 9-10) is far from clear, historians tend to place them in the early 3rd c. BC (Delev 2000: 391). Taking into consideration the composition of coin hoards in north-eastern Thrace, in which silver Istrian drachms (Dima 2011: 47-60) were regularly added to other gold and silver Macedonian coins, and the epigraphic document found in the indigenous urban centre of Sboryanovo, mentioning an Istrian citizen, possibly involved in the rebuilding of the city defences (Chichikova 2015: 59-74), we can observe that in the late 4th c. BC-early 3rd c. BC strong ties arose between Thracian polities, and especially Istros, suggesting thus a challenge to Lysimachus' authority – either a war alliance, or perhaps a protectorate of the Thracian king (Vîlcu 2014: 99). The war between Lysimachus and Dromichaetes can possibly be better explained as a competition to establish who should control west-Pontic cities. Callatis' presence remains harder to be viewed in the context of this war. In the first two decades of the 3rd c. BC, Callatis was experiencing a severe economic crisis, as suggested by a decrease in imported amphorae (Buzoianu 2016).

The death of Lysimachus, in 281 BC, brought an end to the Macedonian military presence in the west-Pontic cities and a consistent reconfiguration, at all levels, of the power networks established by him in Thrace. Moreover, the quick death of Lysimachus' victor, Seleucus, the same year, who thus never had the chance to assume the possessions and influence of Lysimachus, created an authority *impasse*. The Celts, who were already drawn closer to the area by the turmoil of Macedonian competitiveness, played out with aid of mercenaries and various regional alliances, started a period of raids and population movements towards Macedonia and Greece (Trogus Pompeius XXV 1, 2; XXXII 3, 6; Pausanias X 19, 6; Justin XXIV, 416; Diodorus, *Library* XXII, 4). This culminated in the establishing of Galatian enclaves in Thrace, the most powerful being located somewhere in south-eastern Thrace, with the capital/royal residence (*basileion)* at Tylis (Emilov 2010). It is hard to say how much of their actions actually influenced the economy or politics of the west-Pontic cities, as the raiders' interests were mostly focussed on Byzantion (Polybios 4.46.1-3) and Asia Minor; but it can be presumed (Avram 1999: 25) that the menace of Galatian incursions could have represented an

[4] Grave 40 excavated in 1972 (Preda, Cheluță-Georgescu 1975: 72, pl. IX) outside Callatis' walls, to the north, which was an inhumation in a simple pit, contained just a black-glossed, late 4th c. BC kantharos bearing a graffito reading: "To Naukasamas, the *syssitoi* of Timonax [dedicated me]. Be saluted all that dedicated me". A *syssition* was an association, of a religious or military nature, of comrades, while Naukasamas is a Levantine name with a Semitic root, an indication for a possible Phoenician origin. These were considered as arguments in favour of interpreting Naukasamas as a Phoenician from the fleet of Lycon, honoured by a band of soldiers under the command of officer Timonax and fighting against Lysimachus (Billows 1997: 447). Certainly, much of Antigonus' navy was built and manned by Phoenicians (Diodorus. XIX 58, 1-5). For a different opinion, see Dumitru 2013: 88-89 and note 36 and Avram 1999: 24 and 551-552.

[5] His installation of the Callantian refugees in a new city can be ascribed in part to a conscious policy of *euergetism*, wholly in keeping with the Spartocid dynasty's history. Hostility to Lysimachus may also have been a factor; Zopyrion's attack on Olbia seems to represent Macedonian encroachment upon Bosporan preserves. Lysimachus' control of the west-Pontic cities, and consequent proximity to Spartocid territory, cannot have been welcomed by Eumelus (Lund 1992: 42).

[6] Close to the end of the fourth war of the Diadochi, in 302 BC, Cassander sent his brother Pleistarchus with an army (12,000 foot-soldiers and 500 horsemen) into Asia to aid Lysimachus. But because the straits were already occupied by Antigonus, he used Odessus as base to send his army by sea to Heraclea Pontica, where some of Lysimachus' troops were quartered.

opportunity for Seleucid involvement in the area to be seen as justifiable, in terms of protection, during times of unrest.

During the 3rd c. BC, the most significant historical event involving Callatis recorded in the ancient sources was the war with Byzantion for control of the *emporium* Tomis (Memnon 13; FGrHist III B: 347-348) – the so-called 'monopoly war'. From Memnon we know that the war was initiated by Byzantion against the Callatians and Istrians, disputing their economic monopoly over Tomis. The west-Pontic coalition lost, with significant costs for Callatis, 'who was unable to recover from this calamity'.[7]

One of the interpretative approaches is to regard this conflict as just a secondary clash against the wider background of political competition between the Diadochi heirs – this time between the Seleucid king Antiochus II Theos and Ptolemy II *Philadelphus*, pharaoh of Egypt, over the control in Thrace and the Pontic region, during the Second Syrian War (Avram 1999: 26-32; 2007: 258-267; Ruscu 2002: 150-161). Assuming the role of protector of the Greek *poleis*, Antiochus initiated a military and diplomatic campaign in Thrace, during which alliances with Thracian dynasts and cities in western Pontus were established. Written sources record him laying siege to Cypsela[8] on the lower Hebros, accompanied by Thracian allies (Polyaenus 4.16), while a *strategos* of Antiochus was honoured in a Doric decree from the middle of the 3rd c. BC, found in Apollonia Pontica (IGB I[2] 388), revealing the support of Antiochus II for the city against the Astae, but which could have belonged to Mesambria (Avram 2003: 1190-93), or even Callatis. In reply to Seleucid pressure in Thrace, Byzantion, supported by Ptolemy II, declared war for Tomis. At the time, the Pontic cities, Istros and Callatis, were allied,[9] according to the Heraclean historian Memnon (FGrHist III B 434), to which Apollonia and Mesambria were added (Avram 2007: 262).

Another view (Robu 2014: 19-36) tends to place substantially more weight on the economic reasons behind the conflict as being sufficient to justify a more regionally based power struggle. Following this second theory, it was assumed that, because Byzantion not long before had bought Hieron from the Seleucids (Polybius 4.50.3),[10] the elimination of other local competition for commerce in the Black Sea was necessary. Set against the background of the succession struggles in Bithynia, and the conflicts of the Diadochi heirs, the 'monopoly war' is dated 255-254 BC (Avram 2003).

A significant epigraphical document, unfortunately not as clear as we would like, has been brought forward as supporting arguments for both approaches: the Callatian decree for Stratonax, the son of Lygdamis, an Apollonian, sent as ambassador to a 'king' to negotiate for 'the rights of the city' (ISM III 7). The intervention of Stratonax was successful ('the Apollonian people demonstrated enthusiasm in saving the Callatians') and 'things have returned to their initial state'. Rows 9-12 from the beginning of the decree refer to 'a king', requested by the Bithynians and Milesians, to end 'an ongoing war against…'. The inscription is then illegible: the preserved letters ΠΟΤΙS allow the reconstruction either as ποτ' Ἰσ[τριανούς], ποτὶ Σ[αδαλαν] or ποτὶ Σ[…]. In the first variant, supported by Avram (2007) and Vinogradov, the Istrians were the adversaries of Callatis. The king being asked to put an end to the war was identified by Avram in the person of Ptolemy II. If the inscription did not actually refer to the war for Tomis, another conflictual relation between Istros and Callatis in the 3rd c. BC remains hard to acknowledge or understand, even if the model of a war-like situation existing between two neighbouring cities can be seen reflected in the conflict between Apollonia and Mesambria during the first part of the 2nd c. BC (ISM I 64; Pippidi 1984: 170-173). If in the cited example the reason for quarrel was the emporium of Anchialos, by changing dates we would have competition between Istros and Callatis for emporium Tomis. Nevertheless, a restoration as 'against the Istrians' does not necessary imply a quarrel with Callatis, as Avram observed. He advanced the possibility of a third participant in the conflict, who, after waging war against Callatis and defeating her, went after the Istrians.

In the restoration variant reading ποτὶ Σ[αδαλαν], two premises ,become involved: the presence of the Astae/ Astai – a Thracian tribe inhabiting the environs of Apollonia (Pseudo-Skymnus 728-730) and the authority of Sadalas[11] in the western Pontus, a Thracian dynast of the first half of the 3rd c. BC, who could 'have led war against the Callatians' (Robu 2014: 24). Callatis would had been, in this interpretation, menaced by a Thracian tribe (like the Astae), while the king, from whom aid

[7] See general comments over Memnon's account in Pippidi 1967a: 14-15, 24; 1984: 164, 167; Rădulescu 1990: 23-28; Buzoianu, Bărbulescu 2012: 24-27.

[8] A significant number of bronze coins of Antiochus II have been found throughout Thrace, especially in Kabyle, which should be interpreted as *sitarchia*, the daily allowance money of the Seleucid soldiers, which was spent locally (Yurukova 1992: 147-151; Draganov 1993: 56-68).

[9] In an older interpretation, proposed by B. Pick and supported by H. Bengtson and Iu. G. Vinogradov, Istros and Callatis were adversaries, and not allied (Avram 1999: 29, n. 122; 2007: 261).

[10] Dumitru (2015: 296), however, argues that Hieron became Seleucid only after the war of Antiochus II with Byzantium; he also promotes the earliest cultic function of the site.

[11] A king Sadalas is mentioned in an inscription at Mesambria (IGB I, no. 307). Mesambria was paying the king tribute. The date of this inscription remains debatable, between the time of the Celtic invasion (Mihailov 1970. No 307) and the second half of the 3rd c. BC (Danov 1968: 36, 434), as does the affiliation of the dynasty of Sadalas (Odrysian or Astaean?).

is sought, could had been Antiochus II Theos,[12] or a Thracian king – the name of whom starts with Βιϑ. Robu (2014) argues that Callatis' cry for help would be easier to explain if the menace were a Thracian tribe, rather than a war with Istros. The Astae could be regarded, as well, as allied with Byzantion against Antiochus II Theos and Callatis.

Callatis minted a large quantity of silver tetradrachms during the Second Syrian War (Vîlcu 2014: 100). The recent publication of the so-called 'Black Sea Hoard' (Marinescu, Lorber 2012), hundreds of silver tetradrachms originating from a variety of minting centres with a prevalent west-Pontic component, emphasizes strong ties between cities such as Callatis, Odessos, Mesambria and Dionysopolis, who, during the third quarter of the 3rd c. BC, shared coinage standards (Vîlcu 2014), and very probably also a common political attitude. Moreover, the presence in the hoard of 35 tetradrachms of Antiochus II and Antiochus Hierax, evidently struck in Istros, supports the previously proposed hypotheses (Vîlcu, Petac 2012) concerning the strength of Seleucid ties with west-Pontic cities during the Second Syrian War, particularly with Istros, with whom a later reconnection was made, very probably as a base for securing mercenaries for Antiochus Hierax in his feud with Seleucus II.

Going with the interpretation favouring the decisive impact of the wider politics, we consider that the declaration of war for Tomis and the siege of Byzantion succeeded in relatively short sequence (255 BC). In 254 BC the siege enforced by Antiochus II was lifted, with Heraclea Pontica and Ptolemy II siding with Byzantion. Escaping the siege, Byzantion was able to focus on the war for Tomis. Eventually, Callatis opened peace negotiations (254 BC). Hostilities continued at Istros until Bithynia and Miletus (?) asked the king (identified as Ptolemy II *Philadelphus*) to end the war.[13] At a larger scale, the implication for the Lagides was their increased access to the Black Sea (Polybius 5.34.7-8), further strengthened in the context of the Laodicean War and Third Syrian War.

The outcome of the war can be observed in the swift change of the numismatic series, as Istros, Odessus and Mesambria started to mint, for the first time, posthumous Lysimachus staters after the Byzantion model, at once, with the first ever series of staters for Tomis, also of Lysimachus type, sometime around 250-240 BC (Petac, Vîlcu 2012). This monetary reform of the gold coins reveals, in fact, a political decision following the establishment of the new Ptolemaic hegemony in the Black Sea, and the contribution, the largest on the part of Odessus (Petac, Vîlcu 2013), of the western Black Sea cities to the war effort of the Ptolemaic party on the eve of the Third Syrian War. The absence of early posthumous Lysimachi staters from Callatis may mean that the city was punished and excluded from the wider political events.

Even if, at the scale of the discord of the large Hellenistic kingdoms, the war for Tomis ('the monopoly war') were only of secondary importance, its consequences for the Pontic area appear nevertheless considerable, especially for Callatis, which paid a heavy economic toll and significantly lost its regional political influence.[14] On the contrary, from now on Tomis started to grow, freed from monopolies (Buzoianu, Bărbulescu 2012: 27-28, 31-32; 2014: 199-201), and starting its own mint.

No other political event of the 3rd c. BC can be recognized in the written sources mentioning Callatis. It is possible that the ISM III 106 inscription, for a *strategos* or *phrourarhos* who 'defended the city and territory', and who returned to the Istrians a number of prisoners by paying their ransom, might refer to the same 'war for Tomis'. Another epigraphic document (ISM III 2) seems to also record some war activities (suggested by the term ἀνδρογαθία), whose exact circumstances remain unknown. The end of the 3rd c. BC and beginning of the 2nd c. BC were marked by Bastarnae raids (Strabon VII, 3, 15,17; Trogus Pompeius XXXII, 3, 16), and the creation of small Scythian kingdoms in the region between Callatis and Odessus (Pippidi 1967a:150-152; Irimia 2000-2001: 299-317).

Landmarks of Callatis' urban zone: fortifications, sacred areas, and harbour

Nicolaie Alexandru

In this section, regarding Callatian enclosures, organization of the urban space, sacred areas and harbour, even if we are mainly interested in the 4th-3rd c. BC as a general framework for analysis of the Documaci mound, we will also discuss the urban phases which followed (Sauciuc-Săveanu 1924: 108-165; Alexandru *et al.* 2012: 437-463; 2018) to help draw a sharper image of the urban spatial evolution and emphasize the dynamic nature of the fortification lines. It must be said that, in the case of the archaeological excavations at Callatis, due to its overlap by the modern city of Mangalia, in the vast majority of cases the archaeological information obtained suffers from the limitations imposed by rescue excavation conditions. Thus, any conclusions

[12] Avram argues that this interpretation would work only if Sadalas were an Ast, and IGB I² 388 were from Callatis; he regards the inscription as being from Mesambria (Avram 2007).

[13] The latest date to which the conflict could have lasted was the peace between Antiochus and Ptolemy II from 253 BC (Avram 1999: 32). For the chronological sequence, see Avram 2007: 266-267.

[14] Callatis was the only Dorian city in *Pontus Euxinus* not mentioned in the peace treaty of 179 AD with Pharnakes, the king of Pontus (Ruscu 2002: 166, 192, 195).

will ultimately depend on observations made at the beginning of the 20th c. (Polonic 1901), when the earth rampart – the largest of the enclosures – was still visible, on the researches from the interwar period (Sauciuc-Săveanu 1924:108-165; 1925: 104-137), and on the stratigraphic sequences obtained in the latest years of research (Ionescu, Georgescu 1998: 205-207). More detailed archaeological research was possible only in the north-western corner of the fortress (Alexandru *et al.* 2018: 116-132), practically the most recent of the archaeological excavations made in the ancient urban nucleus. All this corroborated information might give us an image of the ancient city's spatial development, in some cases intuitive, in others more precise.

Three routes of fortification walls have been archaeologically attested: the earliest corresponding to the 4th-3rd c. BC, and enclosing an area of *c.* 107 ha (1A in Figure 12); a second route dated at the end of the Hellenistic era (or from the reign of Augustus) to the end of the Roman period, narrowed down the protected area, towards the east, to about 50 ha (2 in Figure 12); and the third and last phase, which reduced the enclosed space to only 23 ha to the north. This last wall belongs to the period of Diocletian and Constantine the Great, until the abandonment of the site at the beginning of the 7th c. AD (3 in Figure 12). This last enclosure was extended to the south by *c.* 50 m in the 6th c. AD, in the time of Justinian, and was probably the last restoration of the fortress wall at Callatis (Alexandru *et al.* 2012: 441). In these areas between the fortified enclosures and the earth rampart, the discoveries of buildings of the Late Hellenistic and Early Roman eras were rare, with large spaces between them. In the central-western area, next to the second precinct, a more compact *extra-muros* neighbourhood from the Roman era was discovered (2A in Figure 12). An *extra-muros* neighbourhood from the Late Roman period developed in the immediate vicinity of the north-western corner of the late precinct. Urban aspects involving dwellings dated to the 4th-3rd c. BC were traceable in archaeological excavations outside the Roman and Late Roman era enclosures. Thus, protected by the enclosure built in the 4th c. BC, these Callatian neighbourhoods were organized according to a Hippodamic plan, with streets orientated NE-SW. Constructions that belonged to sacred areas were discovered at two points, one outside the fortress, near the north-west corner, and the second inside the fortress, to the south (1C in Figure 12).

The city's necropoleis were located outside the defence rampart, or even on it. For the end of the Classical and into the Hellenistic periods, the burial grounds were organized around the gates and along the roads that exited the fortress. During the Roman period, the inhabitants made use of the burial grounds located in the immediate vicinity of the walls, but also further to the north, along the road to Tomis (Preda, Bârlădeanu 1979: 97-107; Bârlădeanu-Zavatin 1980: 216-240). The paleo-Christian cemeteries, of the 4th-7th c. AD, were organized along the earthen dyke,[15] focused around a cemeterial basilica located in the west of the city (Alexandru 2013: 685-690).

Submerged city

Although discussions about the foundation of the Dorian colony of Callatis remain open,[16] direct literary information,[17] as well as archaeological remains, attest a presence with any certainty starting only with the 4th c. BC. As the sea level was then lower by *c.* 4 m compared to today (Preoteasa *et al.* 2012: 212), any restoration of the ancient shore in antiquity must take into consideration a line running *c.* 150-200 m further east. In this situation, it results that an area measuring between 10 and 14 ha of the old fortress has since been submerged. The only observations relating to the submerged vestiges are from the 1950s and 1960s (Scarlat 1973: 529-540). In the years that followed, the monuments under the sea were completely destroyed by extensive dredging carried near the city of Mangalia, especially in 1971-1972. In this period, dredging also occurred at the mouth of Lake Mangalia during shipyard construction. Due to these interventions, the archaeological information here seems lost, including any information that might help in attesting any earlier habitation. What we do know, though, is that it is only from the middle of the 4th c. BC that the city of Callatis started to become influential in terms of the politics and economy of the west-Pontic coast.

The 4th-3rd c. BC defence lines

Since this date, the middle of the 4th c. BC, the existence of a defence system, consisting of an enclosure wall and a rampart-ditch fortification, is attested both archaeologically (Alexandru *et al.* 2012: 439) and in our literary sources (Diodorus XIX, 73, 1-7). Significant data about the rampart can be extracted from Pamfil Polonic's notes made in the autumn of 1901, at Callatis; the topographer identified a defence ditch, 3-4 m wide and 1-2 m deep (Alexandru *et al.* 2004-2005: 425, pl.1, fig. 1). Some aspects concerning the rampart and the walls, which can no longer be seen, were recorded on a map dated 1925 (in a Polonic *ms* in the Romanian Academy), and in the plans published by Th. Sauciuc-Săveanu

[15] This situation shows that the rampart was not functioning at that time as an effective defence line.

[16] For an early foundation: Pippidi 1965: 152; Avram 1999: 9; for the end of the 5th c. BC: Alexandru 2011: 85-87; for the beginning of the 4th c. BC: Preda 1968: 8; Ulanici 1974: 191-195. According to a new contribution on the date of the founding of the city of Callatis, which analyses the ancient sources (Yailenko 2015-2016: 17-18), the early founding, i.e. the end of the 6th c. BC, is the best supported historically.

[17] The oldest literary information about the Callatians is that of the presence of the officer 'Cretheus of Callatis', in the army of Alexander the Great (Suceveanu 1966: 340).

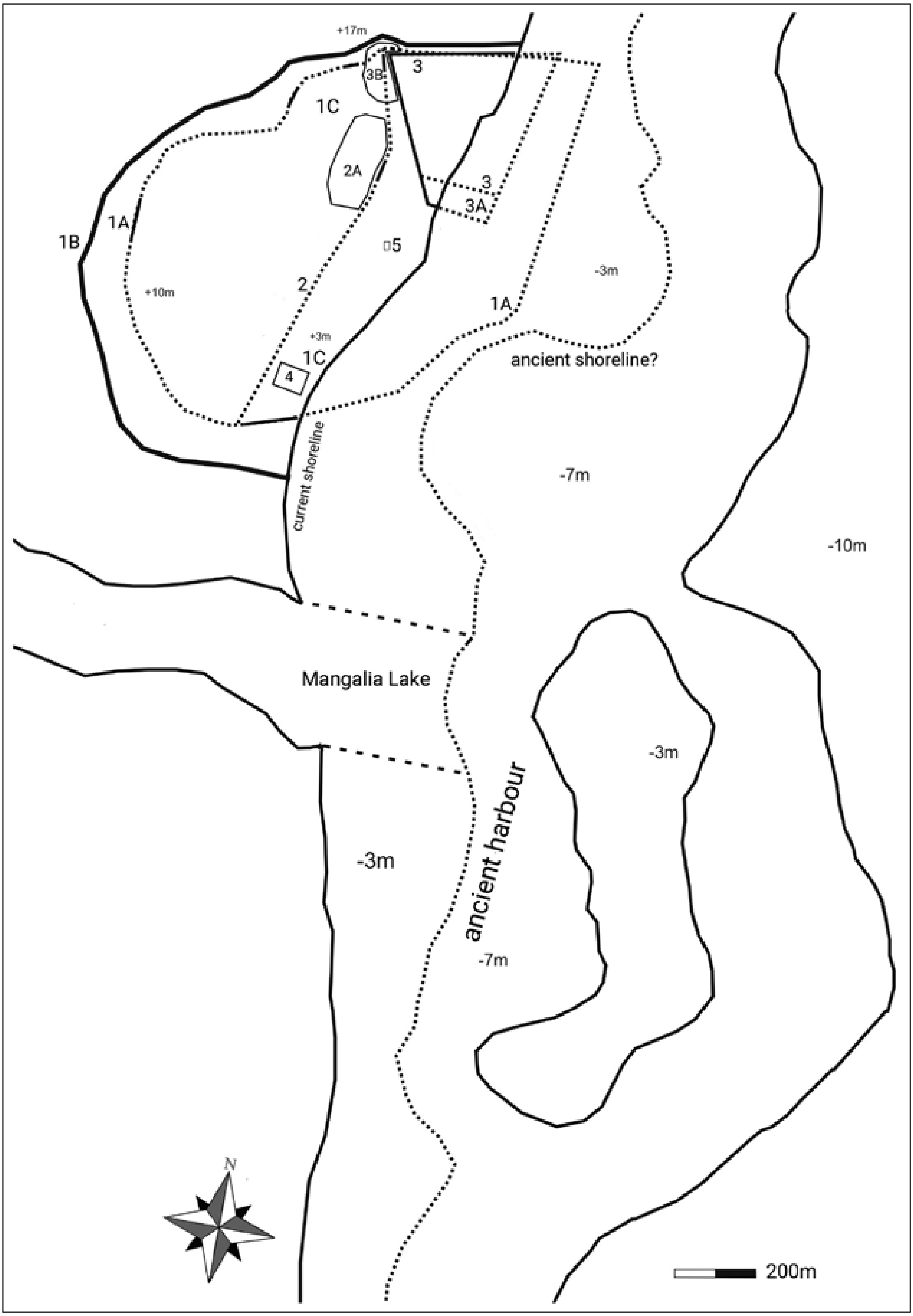


Figure 12. Callatis, the ancient harbour area and defensive lines: 1A) 4th-3rd c. BC wall; 1B) rampart; 1C) 4th-3rd c. BC houses; 2) Roman period wall; 2A) Roman period *extra-muros* neighbourhood; 3) Late Roman wall; 3A) extension of the Late Roman wall; 3B) Late Roman period *extra-muros* neighbourhood; 4) sacred area; 5) mosque.

(1941-1944: 248). The enclosure wall, built in the 4th c. BC, was identified at several points in excavations undertaken in 1960s and 1970s, so that an outline can be established for the rampart. This rampart closed a perimeter that had been preserved as an urban area throughout antiquity, even if the fortified wall retreated in two stages, eastwards and then northwards (Figure 12).

The fortification wall of the city, built in the 4th c. BC, was observed in the 1980s *c.* 12 m south of the enclosure's north-west corner (Alexandru *et al.* 2012). It was researched along a length of 9.50 m, the thickness being 4.10 m. Both the outer and the inner facings were made without binder; between the two faces the *emplecton* consisted of crushed stones mixed with earth. The base of the exterior facing was formed of partially dressed limestone slabs (plinths), 1.2-1.4 m long and 0.80-0.95 m wide. The slabs were placed on a layer of reddish clay, well beaten. The route of this wall was also intercepted on its north side, under Constanţa Highway and on Ţepeş-Vodă Street. On its west side, the route was identified at the intersection of the railway with Oituz Street. On the south side, the wall of this period, featuring the same dimensions and constructive style, was identified in front of the Army House in Mangalia (Alexandru *et al.* 2012: 439).

The urban stratigraphic sequence

In the research carried out so far in Callatis, inside the ancient city, fifteen occupation levels have been recorded. If a first level, from the end of the 5th c. BC, remains unclear, the others were identified at different points within the enclosed area (Alexandru *et al.* 2012: 448-449). Two habitation levels were attested for the 4th-3rd c. BC, one for the 2nd c. BC and one for the 1st c. BC. So far, no level corresponding to the 1st c. AD has been attested with certitude. A stratigraphic level corresponds with the 2nd c. AD, two with the 3rd c. AD, and then one layer for each century until the 7th.

In the archaeological researches carried out during digs for sewers on M. Eminescu and V. Alecsandri streets (Alexandru *et al.* 2004-2005: 431, pl. 7), inside the last phase of the enclosure, structures were observed that immediately overlapped the Roman level, suggesting perhaps Byzantine-period habitation (10th c. AD), or perhaps Genoese (13th-14th centuries). The latest are the constructive levels from the medieval era, and Ottoman times (15th-18th c.), which were concentrated south and west of the Esmahan-Sultan mosque[18] (5 in Figure 12). It should be mentioned that construction levels of the modern and contemporary eras have kept the same orientation of the streets and houses since antiquity, depending on the walls of the ancient fortress (Alexandru *et al.* 2012: 449, n. 44). This proves that when the first urban reorganization of the modern era was made, in 1880, the fortified walls and the city rampart were still landmarks influencing the city's plan.

Houses from the 4th-3rd c. BC

Parts of several houses dated to the 4th-3rd centuries at Callatis were researched in several areas inside the enclosed space (Alexandru *et al.* 2018: 82-113, 134, 166-171). They belong to Greek-type houses – with inner courtyard, one storey, and sometimes a basement. Since the respective investigations had a preventive nature, made at the request of land-owners, no ancient house was researched in its entirety. But from the dimensions of the researched compartments it can be said that they belong to the classic type, with a square plan and a side of about 17 m (Chamoux 1985: 285).[19] In one of the excavations (on Mihai Viteazu street), at -1.50 m compared to the current level of the street, a street from the 4th-3rd c. BC appeared. Its width was 3.20 m. The street, oriented NE-SW, was bordered by large limestone blocks measuring *c.* 0.50 m x 0.35 m x 0.30 m, and the pavement was made of crushed limestone beaten with earth. The substructure of the street was constructed of crushed limestone placed over a levelling (Alexandru *et al.* 2018: 102).

A gate of the 4th-3rd c. BC and its subsequent phases

A city gate used during the 4th-3rd c. BC was excavated at the north-west corner of the enclosure. It was the main northern gate for the road leading to Tomis. The street has three preserved phases: the first dates to the 4th-3rd c. BC, the second from the end of the Hellenistic era and the beginning of the Roman era – the time of Augustus,[20] while the third phase belongs to the time of Trajan.[21] The first phase was studied in a trench going through a modern pit that dismantled the gate. The second phase, the most spectacular, in which the street pavement, consisting of massive limestone slabs survived, had a width of about 4.5 m, with kerbs made of limestone blocks. It was uncovered along a total length of *c.* 28 m. In the middle of the pavement there were still the grooves made for cart wheels, with a width of 1.50-1.55 m. To the east, near the pavement of the third phase, to which a drainage channel belongs, a fragmentary milestone pillar of the 2nd c. AD was discovered. The milestone pillar, the base of which seems to have been discovered a few metres to the

[18] Mosque built in 1575 by Esmahan Sultan, daughter of Sultan Selim II (1566-1574) and wife of the Grand Vizier Sokollu Mehmed Pasha.

[19] For some reconstruction proposals for Hellenistic-era houses from Callatis, see Alexandru *et al.* 2018: 274.

[20] For constructions from the time of Augustus at Callatis, see: Avram 1995: 28; ISM III 58; Avram, Ionescu 2016: 451-454.

[21] According to the milestone discovered here (Alexandru *et al.* 2018: 128-129), see the discussion below. On constructive efforts during the reign of Trajan at Callatis, see: ISM 59: 83.

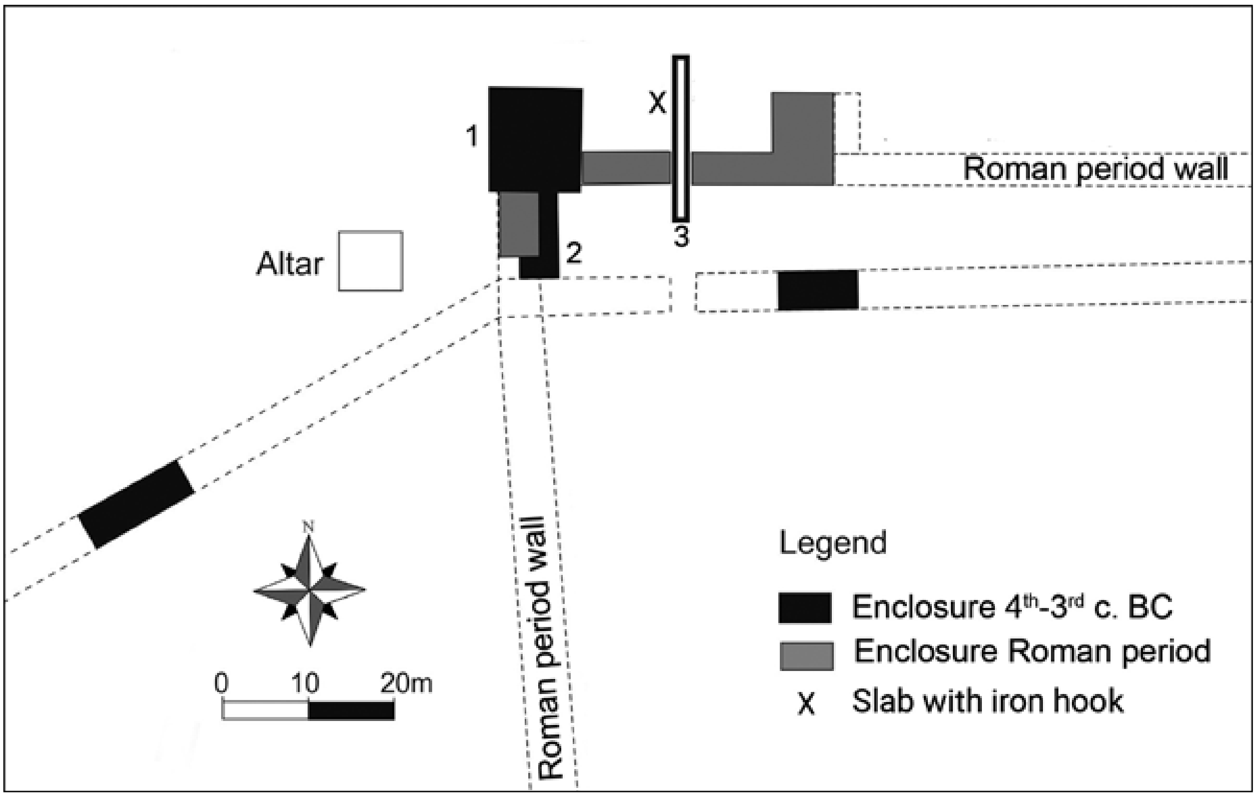


Figure 13. Callatis, the north-western corner of the fortified line during the Hellenistic and Roman periods. The layout of the Roman period wall and the altar are approximated.

south, may be related to the restoration of the coastal road between Callatis and Tomis, during the second c. AD, in the time of Trajan's reign.

For the fortifications in this area, three phases were recorded, corresponding to the restoration stages of the road. In the eastern profile of the excavation, among the nine identified depositional layers, three constructive levels were recognized: one of the 4th c. BC, corresponding to the first precinct; a levelling with brown-yellow earth, dated in the 1st c. AD (on this level was also placed the block with iron hook), which corresponds to the second phase of the road and the second route of the enclosure; a habitation layer from the Roman era, which corresponds to the third phase of the street and the repairs from the 2nd c. BC. (Alexandru *et al.* 2018: 118).

A rectangular construction, measuring 11.30 x 10.06 m, was discovered in the centre of the researched area (1 in Figure 13). It was made of large limestone blocks with traces of clamps in the shape of a swallow's tail. The construction has a *krepidoma* with two steps, the elevation retreating from the foundation on the eastern, northern, and western sides. Adjacent to this is a fortified wall that goes south (2 in Figure 13). According to this single connection from the first construction phase, it seems that the ensemble represents the remains of a gate with an advanced tower – a corner tower of the north gate, built in the 4th c. BC. The first phase of the street discovered here corresponds to the construction of the gate in the 4th-3rd c. BC. In this case, the gate of the fortress was advanced in relation with the alignment of the wall of the 4th c. BC, a few metres to the south of the wall line built at the end of the Hellenistic era (Figure 13).

The enclosure wall dated to the end of the Hellenistic era has been preserved on a length of 5.80 m (the outer facing on one course of its elevation) and on 7.50 m the inner facing. The exact width of the gate was not established, that area being affected by a modern pit. The alignment of the wall at the end of the Hellenistic era included on its route the tower from the first phase, which became a corner tower in the new curtain. On this wall route a second tower stood to the east, thus for this second phase the defence system consisted of two towers. In the south-western extremity of the researched area, the defence wall of the Roman fortress was identified to a length of 14 m. It could possibly be a restoration from the Trajan era, built at the same time as the street, or a new one, made under the patronage of the governor Valerius Bradua. The last phase of occupation in this sector belongs to the Roman-

Byzantine era, consisting of pavements and houses of an extra-mural habitation, with the route of the enclosure at that time being some 15-20 m to the south.

Financing the building of enclosures

The financial implications in terms of building a fortification wall must have been enormous, more than likely exceeding the revenues of a city like Callatis. It may not be by chance that their constructions were done under the protection of greater powers. As Alexander the Great, and the Hellenistic kings that followed, directly financed the construction of such fortifications in Asia Minor (Pedersen 2010: 278), it is possible that they did the same too for west-Pontic cities when they were under Macedonian control. Thus it is no coincidence that Callatis built its first fortification wall during Macedonian rule.[22] At the end of the 3rd c. BC the abandonment of housing over large areas and the termination of occupation in the settlements of the region,[23] i.e. Albești (Buzoianu, Bărbulescu 2008: 34), Hagieni, and Coroana (Alexandru 2016a: 394- 395), should be interpreted as signs of massive depopulation of the city and territory.

The second layout of the fortified enclosure, dated during the reign of Augustus, was built under the authority of the Roman Empire. At the same time epigraphic sources recorded the involvement of several important figures from Callatis in efforts to revive the fortress – a family of founders. The political actions of the Callatians in appointing high Roman officials as city patrons should be seen in connection with this renewal – or 'Renaissance' – under Roman domination.[24]

In the 2nd c. AD, after the Costoboci invasion, one of the measures taken by Marcus Aurelius was to repair the fortifications of the cities. A bilingual inscription addressed to Marcus Aurelius and Faustina discovered at Callatis (Vulpe 1968: 170) notes that the walls of the fortress were built with the proceeds of a special tax, instituted by the governor of the province (Ştefan 1975: 170; ISM III: 97-98). Another inscription (ISM III 99) which, in addition to repairing the wall, refers to the rebuilding of seven towers and mentions the governor M. Valerius Bradua, the first *pontarch*, chief magistrate of the Hexapolis association, and his son, also a *pontarch*. These inscriptions suggest that by this time the Roman administration was involved in the restoration of the Callatis fortress, along with some important city personages. The third fortified enclosure, which functioned in the Roman-Byzantine era, was related to efforts of Diocletian and Constantine the Great to strengthen the cities throughout their empire.

It thus seems justifiable to consider that the fortifications of Callatis were built during the protectorates of the great powers of each epoch, and with their financial support.

Sacred areas

Constructions linkedd to sacred areas were discovered at two points, one outside the enclosure, near its north-west corner, and the second inside the city, to the south. At the north-west corner, 1.5 m west of the road leading out of the fortress to Tomis, and 4 m north of the route of the Late Hellenistic precinct, a limestone block was discovered with an iron hook, characteristic of places of sacrifice. About 10 m west of the boundary of the area in question, during the mechanical excavation of the foundation of an apartment block, two altars were discovered (Alexandru 2012: 440). This sector was the highest point of the city, the acropolis. The same sector, on both sides of the road leading to Tomis, was used as a privileged area of the Hellenistic city necropolis, an area that may have been linked to state burials and a cult of heroes (Alexandru *et al.* 2017: 215-242).

A second sacred area was explored in the south of the Hellenistic city, where three altars and a temple were discovered (Figure 14). It has been hypothesized that the two sacred areas functioned at different times (Alexandru 2012: 447), but, according to the latest interpretations, it is most likely that they functioned throughout the 4th c. BC - 3rd c. AD. The large altar, of limestone blocks, measured 6.00 m x 4.70 m. The small altar measured 3.35 m x 3.95 m, its base plinths exceeding by 10-15 cm the first course. To the west of the large altar a temple was discovered (6 m x 6.80 m). The temple had on the north side a stone wall that enclosed the sacred area, the wall being preserved to a length of 25 m and a width of 1.20 m (Alexandru *et al.* 2012: 447). Another segment of the same wall was identified in recent years, about 50 m east (Ionescu, Constantin 2017). The sacred area inside the fortress constituted a complex of cult buildings with their own temenos. At 35 m north-east of these buildings a fragment of a semi-circular altar was found. On the same occasion, a small Hellenistic district with houses arranged on either side of a stone-paved street, fitted with a drainage channel, was explored (Alexandru *et al.* 2012: 446-447).

[22] According to unpublished notes by Callatis excavator Elena Bârlădeanu, the wall construction can be assigned to the second half of the 4th c. BC, based on Thasian amphorae stamps. A similar chronology was suggested by materials found in the earliest construction levels of the tower and the road to Tomis, recently researched in the north-western corner of the city. The habitation inside this enclosure can also be dated, starting from the second half of the 4th c. BC (Ionescu, Georgescu 1998) – certified in all excavations in those areas where 4th-3rd c. BC dwellings have been researched – corresponding to the actual streets of Mangalia T. Voda, M. Viteazu, and Delfinului.

[23] This may also have to do with ecological factors, i.e. the sudden drying up of a large part of Lake Mangalia (Alexandru 2018: 100).

[24] It relates to Publius Vinicius (Avram 1998: 115-129), an imperial legate, whose activities in Thrace and Macedonia took place in 2 AD. The second refers to Cn. Cornelius Lentulus Augur, imperial legate, who preceded or succeeded Vinicius (Avram, Ionescu 2013: 167-177).

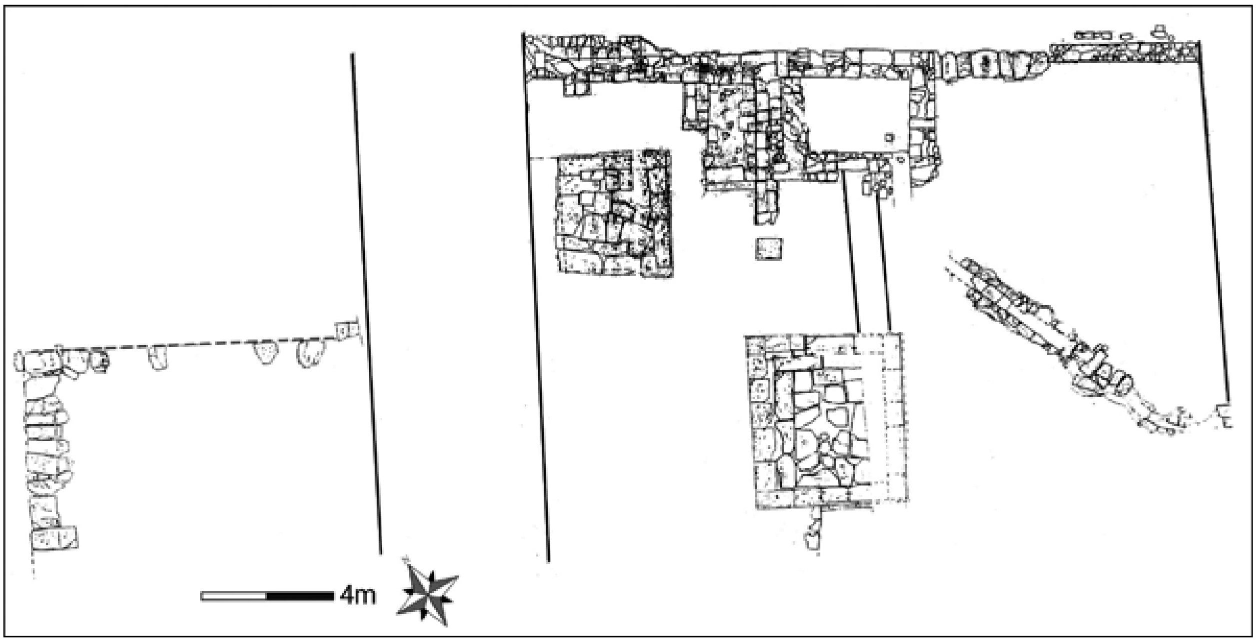


Figure 14. Sacred area in the south of the city (plan by A. Sion).

Harbour

As with all ancient Greek colonies, the harbour was essential. The port of the Callatians was mentioned by ancient historians (Arian 24: 1) and referred to in the inscriptions of the ancient city (Pârvan 1920: 4). Information about the structures of the ancient port were included in the presentations of medieval geographers and travellers, being also the subject of numerous modern studies (Cosma 1973: 31-38; Scarlat 1973; Bounegru 1986: 267-271; Gramatopol 2008: 333-336; Alexandru *et al.* 2012: 447-448).

We proposed a reconstruction of the ancient shoreline based on medieval descriptions, maritime maps drawn at the beginning of the 20th c, and those by C. Scarlat (1973: 529-540). From the bathymetric elevations recorded on Alexandru Cătuneanu's map of 1900 (Maritime Hydrological Directorate 2016: 12), a higher rock can be observed south of the city, about 300 m offshore from the current land strip. This rock was also mentioned in medieval references detailing the entrance to the port of Mangalia (Atanasiu-Croitoru, Cristea 2009: 259). As the sea level in antiquity was 4 m lower, there was, in addition to a shoreline more advanced than today's, a small island in front of the lake (Figure 12). In Scarlat's plan showing submerged features, different constructions were included, exactly on those higher areas.

Today, the harbour is located between the natural bay formed by the lake, the large dam to the south, near the town of 2 Mai, and the dam to the north, near the town of Mangalia. The port of the ancient city was also to the south, the main dam in antiquity being also near the village of 2 Mai,[25] presented in medieval literary sources and preserved in the cultural memory of the locals as the 'Genoese dam'. In medieval times the main entrance to the harbour was from the south, nevertheless there was also a smaller entrance from the north, a configuration that could have existed since ancient times.

Considering the lower level of the sea, Lake Mangalia was very probably a maritime estuary which continued much further inland, connecting the sea with the settlements of the territory.

Above ground today

Of all these mentioned vestiges, three sites can actually be visited in the field: (1) a sector of the northern enclosure of the 4th-7th c. AD, where two towers and the curtains of the fortified wall are preserved; between them and the ancient street part of a Christian basilica complex can also be seen (Teodorescu 1963: 257-300; Preda *et al.* 1962: 439-455; Alexandru 2012: 107-135); (2) the north-west corner of the enclosure, with remains of the Hellenistic and Roman period enclosures, the north gate and the road leading to Tomis (Alexandru *et al.* 2018: 116-132); (3) a tower (of the southern gate) and part of a Roman/Byzantine-era neighbourhood

[25] The ancient settlement located to the south of Lake Mangalia, near the modern village of 2 Mai (Boroneanț 1977: 324 position 25 and 321, fig. 1), may have functioned as a neighbourhood of Callatis, and served the harbour. We support this hypothesis because near this location a flat necropolis was discovered, similar to those of the city (see in this volume Chapter 3.3 – cat. D7-22). In the rest of the rural territory of Callatis only tumuli are identified to date.

(Georgescu, Lascu 1995; Alexandru *et al.* 2018: 43-46), were conserved in the basement of the former Scala Hotel. The ditch encircling the Hellenistic dyke can still be recognized in the topography of the modern city – the ring road still follows its contour line (Portului street).

Burial grounds at Callatis during the 4th-3rd c. BC – a general review

Nicolaie Alexandru, Robert Constantin, Mihai Ionescu

This section deals with the burial grounds developed and used during the 4th-3rd c. BC[26] around the ancient urban agglomeration of Callatis, briefly reviewing their spatial distribution, grave typology, and elements of funerary rites and rituals. For this we assembled a condensed catalogue of discoveries, made at various times over the last 100 years, in the city's late Classical and Hellenistic necropoleis. Data about some of the most recently found graves in Mangalia are also included.

The ancient city occupied an area of 108 ha, to the north of the mouth of the current Lake Mangalia, being protected by a large earthen rampart, which closed off an urban space that had been preserved as such and not used all though antiquity for burials, not even when the settled urban space diminished drastically in the Late Roman period (Alexandru *et al.* 2012). From this rampart/dyke and further into the territory, the land was organized in agricultural and funerary plots for about 3 km around the city.[27]

The legal status of the land within the Greek city-states belonged to a variety of categories: common – *koine*; public/of the state – *demosia*, sometimes synonymous with *koine*; sacred – *hiera*; private – *idia* (Isager, Skydsgaaed 1992: 121), while the concept of *polis* included three essential elements, the city itself – *polis*, the space/territory of those in the 'afterlife' – *necropolis*, and the city estate – *chora*. It was considered sacrilege for the urban area to be used for funerals. Burials in the immediate vicinity of a city must be on public land, i.e. along the roads that entered the fortification gates or those along the city's huge earthen enclosure. As for the tumuli graves (Alexandru 2016b: 143, pl. 1, 3), they were (especially) located on private lots.[28]

History of research

The first systematic investigations were conducted during the interwar period by Oreste Tafrali (1928) and Theofil Sauciuc-Săveanu (1933). For the period immediately following the Second World War, after the deportation of many locals and the reprojection of the street network, the old village was practically destroyed (Eleutheriades 2011: 24) and the reconstruction of the modern town was done without much regard for the ancient city. Research at Callatis was resumed by a team of specialists from the Romanian Academy, starting in 1957, the year when ancient funerary discoveries were also mentioned (Preda *et al.* 1962: 445-446). The founding of a Callatian museum, at the end of the 1970s, paved the way for the creation of a research team dedicated to dealing with these rescue archaeological excavations, resulting also in the publication of studies on the local funerary discoveries (Preda 1962; 1980; Preda, Bârlădeanu 1979; Bârlădeanu-Zavatin 1980). Research has increased in intensity with the expansion of the city in recent decades (Ionescu *et al.* 2003; 2005; Alexandru *et al.* 2018).

A land of tumuli

Funerary mounds were the first to attract the attention of travellers, antiquarians, and, later, specialists. All the cartographic recordings of Mangalia village made at the end of the 19th or early 20th c., depict around it a plethora of funerary mounds (*tepe* in Turkish), many of which became in time true geographical landmarks (Gala Galaction 1997). Referring to the topography of Mangalia, Pamfil Polonic (1901) notes (translated from Romanian):

> 'Around the ancient city, in an area almost 3 km long, there are mounds, some of which are so huge that you cannot believe they were made by human hand. These mounds contain the graves of the ancient inhabitants – perhaps some of them were built by people even more ancient than the Greeks who founded here Callatis. On the farthest hills there are fewer mounds, placed in groups (3-5 mounds). I think that these were used by sentinels to guard the city, some larger ones being surrounded by palisades as fortifications, or as points of support in battle. As you approach the city, the mounds get denser, arranged in straight lines, showing us that roads passed through them in antiquity. Of these mounds, only one was researched by Mr. Sturza, 1 km north of the city, and where he came across very large slabs that had collapsed. Between them they found scattered bones. At 100 m west of the current Muslim cemetery, on a flat field at a depth of only 0.5 m, [slabs] were found with Greek inscriptions. Among the ruins of antiquity visible on the surface, there is a construction in the form of a vaulted cellar, of Roman brickwork, on the shores of Lake Mangalia, to the east of the Turkish mosque.'

[26] No grave older than the 4th c. BC has so far been discovered at Callatis (Alexandru 2011: 85).
[27] Ștefan *et al.* 2017 for discussion on lot division and cadastre units.
[28] Thus their mapping might show a distribution of the *clerouchiae* (Coulanges 1984: 95).

The funerary constructions of the tumulus type researched so far show, as with the Istrian mounds, a certain variety in the construction of their coverings. Based on the typology of P. Alexandrescu (1966: 236-237) we can categorize, from a stratigraphic point of view, the funerary mounds researched in Mangalia as follows:

1. Mounds with simple earth mounds, small in size, with heights of a maximum of 2 m, which were built from a single soil type. Such mounds were briefly researched at Neptun (Irimia 1984: 64-82) and at Constanta Road 26, dated 3rd c. BC, researched 1998-2003 (unpublished).
2. Mounds with a embankments built of two or three layers, i.e. the one researched by P. Polonic in 1904, the mound on 1 Mai street 3rd c. BC, investigated 2000 (unpublished), and the one on Moldova street, dated 4th-3rd c. BC, investigated 2003 (unpublished).
3. Tumulus with complex embankments assembled from alternating layers, i.e. the 'Documaci Mound' (*Movila Documaci*). Here in the summer of 1993, the Callatis archaeological museum of Mangalia initiated an archaeological rescue excavation (Georgescu, Lascu 1995: 44-45). Earlier work was begun in 1941 by Th. Sauciuc-Săveanu and stopped due to the war; the research was continued by V. Canarache, who identified on a coin with the likeness of the Scythian king, Kanites (Canarache 1950: 242). The mound covered a large funerary complex, consisting of a tomb with chamber and *dromos*, oriented east-west, and a rectangular construction, west of the grave, interpreted as a pedestal of a funerary monument, both made of massive blocks of limestone. Graffiti with anthropomorphic, zoomorphic representations, as well as pentagrams and representations of ships were made, at a later date, on the walls of the grave (Papasima, Georgescu 1994: 223-228). Research was resumed here after 2017 and another tumulus with alternating layers was researched in the northern part of Mangalia (Bounegru, Bârlădeanu 1990: 335).

Funerary areas of the 4th-3rd c. BC

The discovered graves dated to the late Classical and throughout the Hellenistic periods can be divided into four main large areas: (A) north of the ancient city; (B) at the north-western corner of the fortification, on both sides of the road leading to Tomis; (C) on the west side of the ancient dyke; (D) south of the fortification, but also south of Lake Mangalia, where a smaller settlement functioning here must have had depended directly on the city and probably served the harbour.

Area A – north of the city (Figure 15)

A1-2 Two graves were discovered (Sauciuc-Săveanu 1925: 114) near the early 20th-c. building of the old 'Prince Carol Foundation', today demolished, in a place close to the current Mangalia City Hospital. One burial was made in a cist of tiles and one was a cremation protected by tiles arranged as a pitched roof. The latter had as funerary inventory a fragmentary amphora.

A3 Burial *c.* 700 m north of the fortification wall, made in a stone cist (Vulpe 1925: 330-331); funerary inventory: a bronze ring, a small ceramic vessel and two Tanagra statuettes. The author observes, in the vicinity of this grave, three mounds.

A4-8 In 1971 (Figure 13), while constructing of a sewer to the south of the stadium, eight graves were discovered, five of which date to the 4th-3rd c. BC (Cheluță-Georgescu 1974: 169-189). Three burials were made in a simple pit, protected by tiles arranged as a pitched roof and one in a stone cist. The funerary inventory consists of ceramic objects, ceramic statuettes, bronze mirror, iron strigil, and silver earrings. The offerings were placed next to the body, under the protective roof made of tiles or stone slabs. In the case of one grave in a simple pit, the offerings were placed under a 'porch' of clay arranged near the tile roof. The grave pits were rectangular, with rounded corners, purified by burning before the buried body was deposited (Cheluță-Georgescu 1974: 187). The fifth grave was that of a child, whose calcined bones were deposited in a type Soloha I amphora (pl. 7.5) (Cheluță-Georgescu 1974: 179).

A9-33 On the north side of the Callatian fortifications, in 1972, while constructing the Paradiso Hotel (current name) and the city stadium, 24 funerary complexes were discovered, of which 23 were inhumation and one cremation; 14 used stone cists and the rest simple pits (Preda, Georgescu 1975: 55-75).

A34 Near the northern walls, in 1999, a systematic archaeological research led to the discovery of a funerary complex with a stone cist orientated east-west, with a ruined inventory from which only a Soloha amphora, dated to the 4th c. BC, was recovered.

A35 In 2014 (Figure 14), rescue archaeological research carried out as part of the 'Callatis – History on the Black Sea coast' project, identified the outline of a pit, in the western side of which a Hellenistic amphora was discovered (depth 1.10 m). Lower, at -2.65 m, a grave of a child enclosed in amphora fragments dating back to the Hellenistic era was found (Alexandru *et al.* 2018: 22).

A36-37 During rescue investigations related to the digging of several sections of sewerage (a total length of *c.* 900 m, 0.80 m wide) and water supply for the area around the Mangalia Municipal Hospital, several Hellenistic graves were identified.

Grave – burial in a stone cist made of limestone blocks shaped at the joints and on the interior; dimensions 2.10 x 0.90 m; the skeleton, oriented east-west, with the skull to the east, was in an advanced state of degradation. Funerary inventory: ceramic *unguentarium* with red fabric, dating to the second half of the 3rd c. BC (Alexandru *et al.* 2018: 200-201).

Grave – burial in a stone cist oriented east-west, with the skull to the east, the dimensions of the cist 2.20 m x 0.95 m; skeleton lying on its back, hands next to the body, legs bent. Funerary inventory: bronze ring, alloy earring that also contains lead, fragmentary statuette of Tanagra type (female character), iron knife, and bronze ring; 3rd c. BC (Alexandru *et al.* 2018: 201).

On the same occasion various vessels, probably belonging to the Hellenistic graves researched in the 1960s by Preda in the same place, were also found: a ceramic *unguentarium*, a fragmentary *kantharos* with black glaze, a fragmentary vessel, and amphora fragments, all dating to the 4th-3rd c. BC (Alexandru *et al.* 2018: 201-202).

A38-41 Four burial graves in simple pits were discovered on N. Iorga street; dated to the 4th-3rd c. BC (Radu 2007: 439-592).

A42-45 In 1980, three graves discovered *c.* 500 m north of the ancient city were published, two inhumations and one *in situ* cremation (Bârlădeanu-Zavatin 1980: 229). An inhumation grave, of the two, had as offerings a funerary wreath (made of gold leaves, gilded-ceramic pearls, tied with a copper wire), a ceramic *unguentarium*, an iron ring and an iron strigil, as well as four ceramic statuettes. The four statuettes were placed horizontally on the chest of the deceased. Two of the statuettes, with a height of 0.135 m, were made in the same matrix: female figures, draped with *chymation*, standing on a pedestal. The third, identical with the other two but with a height of 0.125 m, on which traces of pink and red paint remained on the face of the figurine, and white on the folds of the garment. The fourth, also a female character, was fragmented.

A46 The digging of a sewer in 1978, *c.* 300 m north of the fortress, destroyed a grave, probably a cremation, from whose inventory were recovered 40 glass beads of various shapes, including one anthropomorphic, also two coins, one Callatian and one Scythian. The grave was dated to the second half of the 3rd c. BC (Bârlădeanu-Zavatin 1980: 235).

Area B – north-west of the city (Figure 15)

The researches carried out on several occasions in the 'NW corner of the fortress' have revealed the existence of several important funerary constructions (Figures 10-11). taking into account the types of buildings unearthed in this sector, the quality of their masonry and the discovery of a limestone block with an iron ring, which belonged to a site dedicated to sacred sacrifices, we can say that we are in front of at least two altars (Alexandru *et al.* 2012: 440, pl. 3). Around the northern gate of the city and these altars, one of the most important plots of the Callatian necropolis had developed, starting from the 4th c. BC, on both sides of the road leading to Tomis. The gate was in use from the 4th c. BC to the 3rd c. AD.

B1 In 1959, archaeological excavations were carried out at two burial complexes, located *c.* 50 m east of the city walls (Preda *et al.* 1962: 445-449). The first mound was encircled with a kerb of dressed stones, measuring *c.* 13 x 15 m, to which a ritual platform was adjoined to the west. In the mound's centre a cist was identified, measuring 2.05 x 0.85 m, covered with three limestone slabs. The skeleton of an adult, 1.75 m tall was laid inside. As offerings, in addition to the remains of a gilded-ceramic wreath, the remains of a papyrus, written in Greek alphabet, were discovered. D.M. Pippidi (1967b: 209) hypothesized that the deceased could have been an initiate in the cult of Dionysus, or a dignitary in his hierarchy, according to the discovered inventory. Even after the restoration of this papyrus (Colesniuc 2014: 319-342), the preserved pieces being extremely small, only a few disparate Greek letters can be recognized, and the contents of the text still remain a mystery. Eight secondary burial and cremation graves were also discovered in the mound. Among them were identified two burial graves of a child in amphorae; in one case the amphora was broken, and after the introduction of the body the upper part was replaced; in the second case, ceramic-fragments from other vessels were used. A tomb was also investigated here that had in its inventory a gilded crown, similar to the one found in the papyrus tomb. It is a cremation tomb that used as a funerary urn an amphora of old tradition (Figure 14/f), having in front of the handles a human ornament (a female head) in relief; the amphora's neck was decorated with leaves and white dots, the body featured eggs and spirals in white and red paint, and the base had ornaments in the shape of eggs (Preda 1961: 299, pl. 17).

B2 About 10 m south of mound B.1 a second mound was investigated, covering a rectangular stone structure measuring 12 x 6 m which surrounded three cremation pyres (*rug-busta*) (Preda *et al.* 1962: 448).

B3 In the embankment of B1 tumulus, on the north side, a tomb in a tile cist with a very rich inventory was discovered: a *lekane* vessel with a ceramic lid painted with red figures in two registers with winged griffins, and in the other two busts of *arimaspoi* with a rosette (Alexandrescu-Vianu 2009), three statuettes 0.074 m high (representing actors or satyrs), two ceramic medallions with the head of Medusa, 24 small statuettes grouped in five categories (the goddess Nike, girls dancing, singers with lyre, dancers, characters with shield and helmet), 66 small clay figurines with animal and vegetable representations, 110 small beads and small bronze elements. The tomb was dated to the third quarter of the 4th c. BC (Preda 1961: 193, pl. 10-12).

B4-5 At the same time two more inhumation graves were investigated, deposited in a stone cist, and preserved today inside the museum in Mangalia; no funerary inventory exists for these (Preda 1961: 280).

B6 In 1972 a stone cist was discovered *c.* 30 m NW of the papyrus tomb (B1) (Preda 1961: 193, pl. 10-12). The inhumation grave had as inventory a bronze mirror next to the right hand, and next to the feet five ceramic statuettes. A clay figurine represents a female character, with a height of 0.145 m, without a specific attribute of a deity. It is made of fine, reddish-brown clay, well burnt, the whole surface retains traces of white paint, except for the back that is not worked. The head has a tiara, on which traces of blue paint can be seen, and the hair has remnants of reddish-brown paint. A second burnt clay statuette, female, had its back unworked, perhaps representing Kore, with a height of 0.091 m, reddish ceramic with traces of white paint, on her head a *polos*. Two identical terracotta statuettes representing Eros-Thanatos. One well preserved, the other fragmentary, the head missing, the complete one has a height of 0.110 m. Both were made of the same matrix; on their heads they wear the *polos*. The last statuette described by the author of the discovery is a child standing on an altar, with a height of 0.098 m. It is fragmentary, a laurel wreath can be seen on the head (Cheluță-Georgescu 1974: 185-186).

B7-8 About 30 m west of the north-west corner of the fortress, in 1973, a double-cist was discovered (Bârlădeanu-Zavatin 1980: 228-229). It is interesting that one of the cists contained an inhumation and the second an urn with cremated bones. This stands as evidence for the practice of biritualism within the same family. The urn, placed in the south-west corner of the cist consisted of an amphora with a lid, of Alexandrian origin (Figure 14/a). The burnt bones were deposited inside, and as a funerary inventory it contained a glass vessel and a bronze ring, deformed by fire. The inhumation grave was well-preserved; as funerary inventory it had an iron strigil and a ring of the same material. The stone boxes had on the long walls – as is common – communication windows. At the same time an incineration tomb was discovered – a pyre with remains left on the spot – protected by tiles arranged in a pitched roof; it contained an alabaster vessel as inventory. According to the stamped tiles, the tomb is dated to the 3rd c. BC (Bârlădeanu-Zavatin 1980: 229).

B9-26 In researches carried out between 1999-2003 in the same area, 18 funerary complexes were found dating to the Hellenistic era, and four to Roman times, as well as other funerary constructions – stone rings and platforms. The Hellenistic tombs were of the following types: cremation tombs of the rug-*busta* type; three urn cremation graves; reburial in a *pythos* vessel; inhumation in pit graves; tombs in stone cists protected by a ring of limestone blocks; inhumation grave in a transverse niche (Alexandru *et al.* 2017).

B9 The urn was represented by a local hand-made vessel of coarse paste, decorated with buttons and alveolar belt, secondary burned; it was covered with a ceramic plate, made of grey paste, with a diameter of 0.24 m (Figure 14/c). The orientation of the pit was approximately NW-SE. In the urn, in addition to ashes, the following objects were deposited: ceramic *unguentarium* dated between the end of the 4th c. BC - middle of the 3rd c. BC; a bronze mirror, and several polychrome glass beads.

B10 The second cremation grave, with the ashes deposited in an urn, had as inventory an anthropomorphic bead made of polychrome glass. The urn was 0.26 m high, with yellow-brown engobe, decorated with three circular stripes of ochre paint on the body (Figure 14/b).

B11 In the case of the third cremation grave the urn was a vessel with two handles, with traces of secondary burning (Figure 14/d).

B12 In this sector a very rare occurrence was documented – a reburial in a *pythos* belonging to the Hellenistic era (Figure 15). The vessel was found at a depth of 3.10 m, bordered by unworked blocks and covered with a limestone slab; bones of two skeletons were partially reburied inside. The *pythos* measured a height of 0.54 m, bottom diameter of 0.18 m, and mouth diameter 0.237 m. As inventory it contained: two alabaster-type vessels; an attic bowl, decorated with palmettes inside; a bronze mirror, with the handle decorated with two volutes and a palmette; an iron ring; an iron strigil; a bronze needle; pyxis with cap, yellowish-brown colour. The grave dates to the 3rd c. BC.

B13 In the same excavated sector a construction was found that consisted of an altar built to the west of a stone wall and shaped as half a ring. It was made of earth-bound limestone blocks, measuring 4.31 x 1.10 m. The rounded part, 6.67 x 4.03 m, had the elements of an *escharon* (Alexandru *et al.* 2017: 220). Its substructure

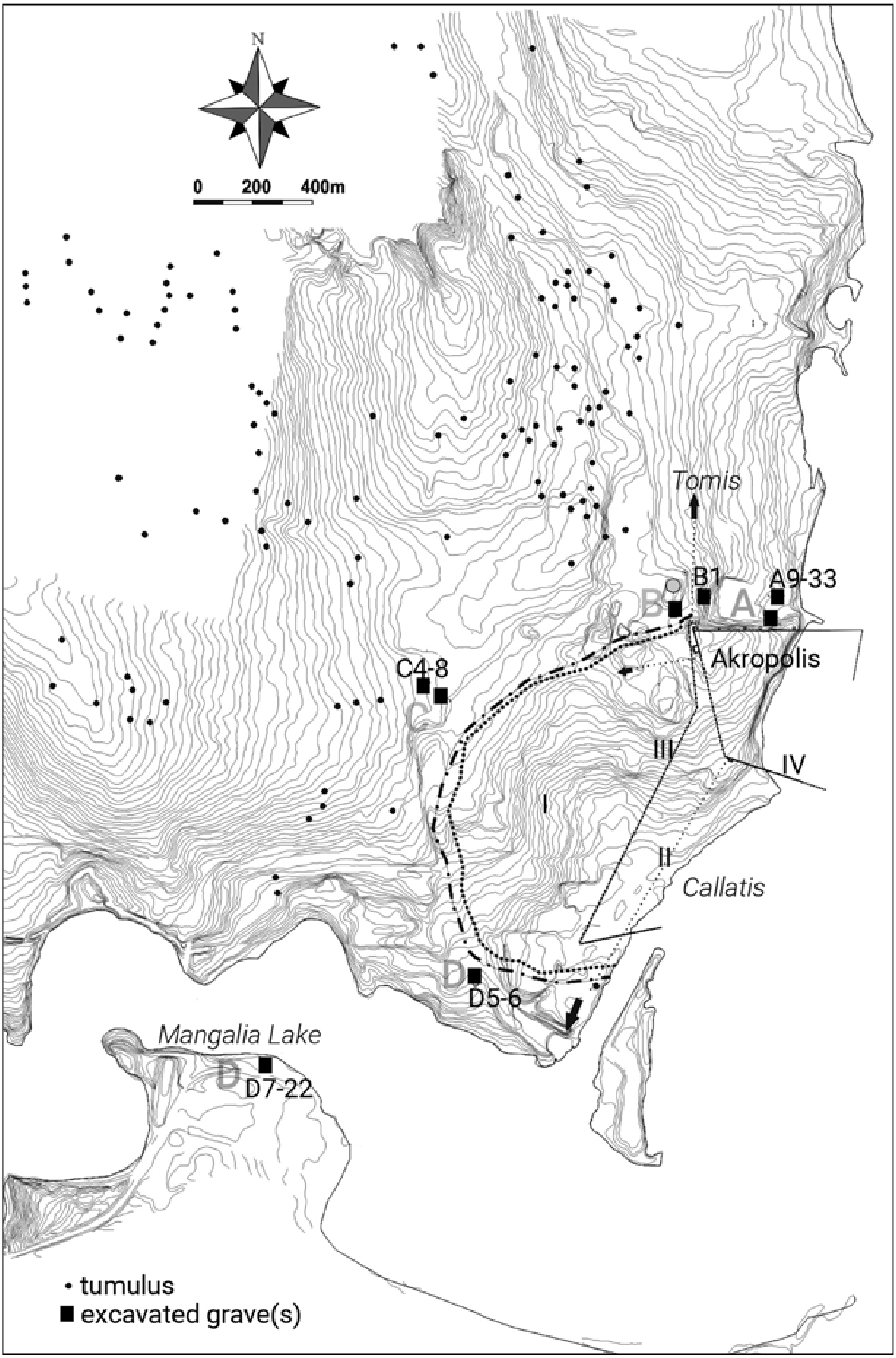


Figure 15. Necropolis plan. Main funerary areas: (A-D); I) Hellenistic urban area; II) temples area; III) Roman wall; IV) Late Roman wall.

consisted of four levels of burnt soil alternating with layers of yellow earth. The term *escharon* has a variety of meanings, but it is mainly explained as the place where fire is made, and left empty inside (Roger, Gilbert 1990: 148-155), being related to the cult of heroes or Chthonian cults (Ekroth 2002: 11). The term *escharon* appears only on inscriptions from Delos, from the first part of the 3rd c. BC, until the middle of the 2nd c. BC; in one of these inscriptions, the one from the ruined sanctuary of Archegesion, it is related to a hero (Ekroth 2002: 29). The literary evidence for the *escharon* as a certain type of altar for the cult of heroes is found in a line of Neanthes of Cyzicus: 'Candles are for gods and *escharas* for heroes'.[29]

Discoveries in this area (Figure 16) allow us to argue that the place was linked to the cult of heroes (Lungu 2000-2001: 186; Quinn 2011: 119-126), an area dedicated to public sacrifices and funeral banquets. In ancient Greece, types of heroes were known for performing great deeds, and after death they were honoured by their sacrifices, prayers, and altars with their names (Quinn 2011: 119). There were heroes, warriors, healers, city founders, and, from the beginning of the Hellenistic era, athletes who were also heroized. The cult of heroes was an amplification of the veneration and remembrance of ancestors, so the ancient Greeks these cults managed to strengthen ties with their past. Prominent positions and visible tomb shapes were reserved for the elites, the tomb becoming both a resting place of the deceased and a place of worship (Nonakova 2012: 197).

Area C – to the west of the Hellenistic city's rampart/dyke (Figure 15)

C1 To the west of the ditch of the fortress, south of today's Oituz Street, a cremation tomb grave was discovered (accidentally) in 1970. It used a bronze *kalpis* vessel as an urn (Figure 14/g-h) (Zavatin-Coman 1972: 104-110). At the time of discovery, the upper part of the tomb was destroyed by a mechanical intervention. The urn, which contained burnt bones, was placed in a parallelepiped-shaped limestone block, measuring 0.55 x 0.60 x 0.42 m. The inner hollow was executed with great care, the outside remaining unfinished. At the top there were four iron studs cast in lead, a sign that there was a limestone protection at the top of the urn, destroyed at the time of mechanical levelling, from this point. The elements of a funerary wreath were recovered, most likely placed on the neck of the urn. The elements of the crown consist of: a lead frame; 34 discs, diameter 0.20 m, of gilded ceramic with the face of Medusa on one side, the slightly convex reverse pierced by two holes; 230 round and gilded-ceramic beads; 25 gilded-ceramic conical beads; *c.* 25 fragments of connecting wires and other bundles of bronze wires with gildedand -ceramic beads at the end. With the funerary inventory a ceramic unguentarium (height 0.080 m) was also discovered. The bronze *kalpis* vessel (height 0.520 m, diameter of 0.345 m) was discovered in a good state of preservation; under the vertical handle is a scene with Dionysus and Ariadne. The tomb was dated to the end of the 4th - beginning of the 3rd c. BC.

C2 Another double-cist with two burial graves was discovered on Țepeș Vodă Street (Bârlădeanu-Zavatin 1980: 223). According to the funerary inventory, the occupants were male and female, most likely a family. One cist had a rich inventory: an amphora, two gold earrings with a lion's head, a gold necklace consisting of 39 tubular segments (6 x 1 mm, hollow), a gold ring with oval plate without decoration, two cylindrical bronze boxes, one of which still contained pink lumps of blush, a bronze mirror, and two small beads of blue glass paste. The second cist had as an offering a ring and a strigil, both of iron.

C3 An important discovery in the Hellenistic necropolis of Callatis took place in 1981 (Bârlădeanu-Zavatin 1985: 85-98), south of Oituz Street. The grave was a double-cist. Lumps of ochre were scattered over the bodies. The grave, presumably male, contained amphora fragments and an iron knife. The other tomb, in addition to three unguentaria and a ceramic support, contained 13 Tanagra-type ceramic statuettes (Figure 19), three representing the goddess Nike, two being made of the same matrix (one of which was fragmentary), with a height of 0.145 m. On the back, near the shoulders, there are small, oblique holes for fastening the wings, which have not been preserved. Two statuettes, representing Eros, were also made of the same matrix, one fragmentary. The entire statuette is 0.122 m tall and represents Eros as a naked child, holding the folds of the *chlamys*. Another statuette, larger but fragmentary, represented a female character on a throne – it was interpreted as Aphrodite. A head of a statuette clearly represented Dionysus, bearing a crown of abundant leaves and fruit. The other six, of which five were entire, had heights between 0.190 m and 0.260 m, and represented female characters. Traces of pigments were preserved on them: mahogany brown for the hair, pink for face and hands, and white for the clothes with grey accents.

C4–8 In the summer of 2000, on Portului Street, at its intersection with Oituz Street, 177 ancient graves were investigated – five Hellenistic, four Roman, and 169 Paleochristian (Ionescu *et al.* 2002-2003: 226-227). The five Hellenistic tombs were classified as: a tomb with a burial chamber and a *dromos*, two graves in a stone cist next to each other, and two cremation graves. The tomb with funerary chamber and *dromos* was destroyed

[29] Ekroth 2002: 50, n.109.

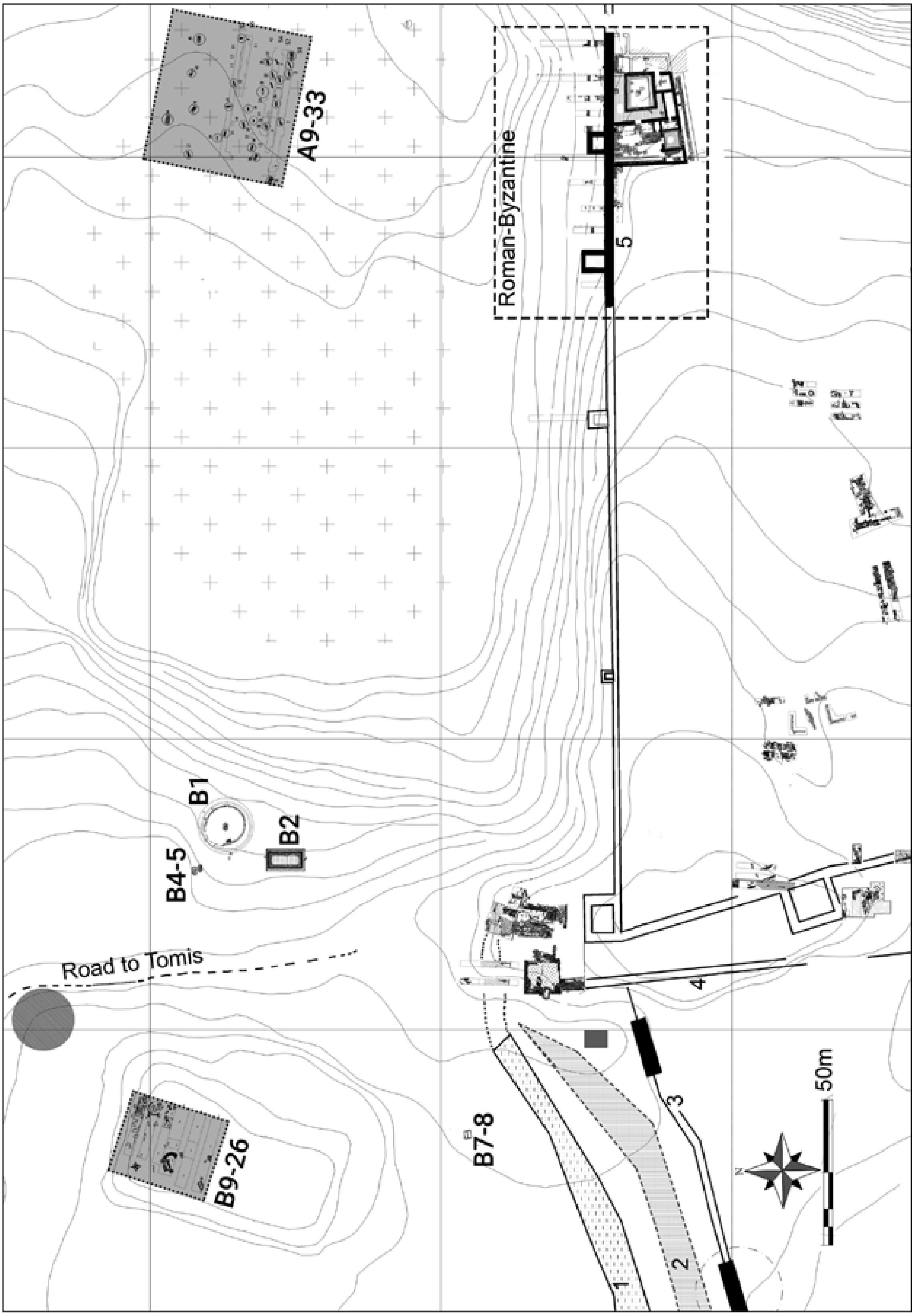


Figure 16. Burial grounds, zones A and B (north and north-west): 1) ditch; 2) rampart; 3) Hellenistic enclosure; 4) Roman wall; 5) Roman-Byzantine wall.

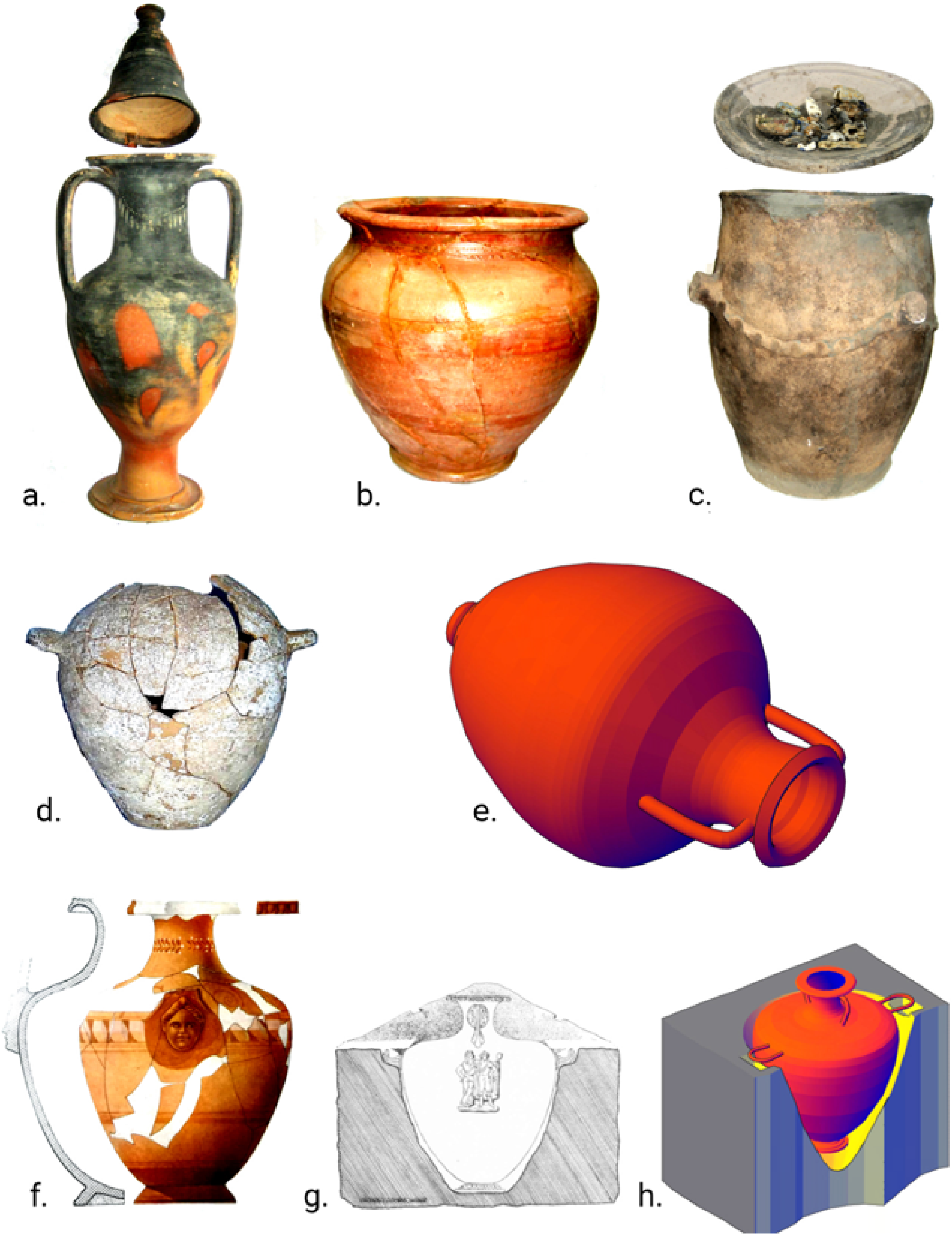


Figure 17. Urns used in cremation graves at Callatis: a) B7; b) B10; c) B9; d) B11; e) A 4-8; f) B1 (after Preda 1961: 299, pl. 17); g) C1 (after Zavatin-Coman 1972: 103); g-h) C1 (photos and 3D reconstructions by R. Constantin. Various scales).

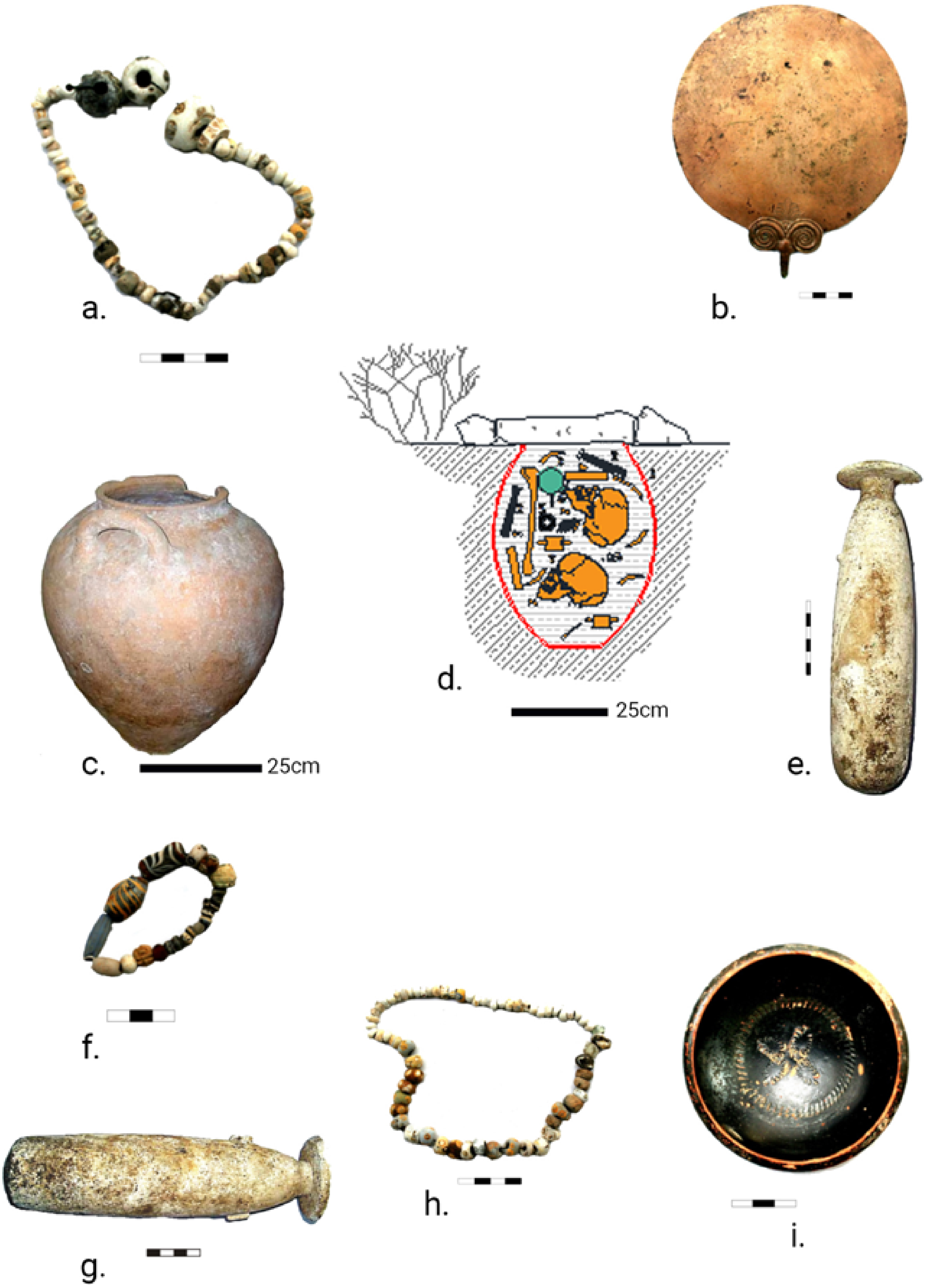


Figure 18. Re-inhumation grave B12 (photos and drawing by R. Constantin).

Figure 19. Terracotta figurines found by E. Bârlădeanu (1985) in grave C3 (various scales; photos by R. Constantin).

by the later graves, only the first course being found. A funeral pyre or an altar was also discovered on the same occasion. This feature consisted of a rectangular construction with three sides, made of limestone blocks and soil, measuring 5.70 x 2.10 m on the outside; the recorded thickness of the wall was 0.90 m on the southern and northern sides and 0.60 m on the eastern one. Two peripheral ditches containing pottery fragments (4th-3rd c. BC) were also discovered in the nearby ditches, the function of which could have been predominantly ritual; in addition remnants of organic sacrifices were identified along with ritual broken pottery. A utilitarian aspect cannot be excluded, as the earth taken from them could had been used to form the funerary platforms; the chamber-type tomb and the two adjacent cists may have been covered by a mound, which flattened over time (Ionescu *et al.* 2002-2003: 242).

C9-19 In 2003, preventive research (Constantin *et al.* 2007: 241-296) preceding the construction of three A.N.L. blocks led to the discovery of a Muslim necropolis and several ancient graves. In all, 15 ancient tombs were investigated, of which eleven belonged to the 4th-3rd c. BC period, and four were Roman. Two of the Hellenistic graves were pyres (*rug busta*) protected by tegulae, one featured an urn, the others were inhumations in cists, pits covered with limestone blocks, or in longitudinal niches.

Area D – south of the city, on both shores of Lake Mangalia (Figure 15)

D1-4 Four funerary complexes and a pyre/or altar were discovered in 1961 (Preda 1966: 137-146), when undertaking levelling works affecting the area located to the west of the small mosque. This was later demolished by the urban reorganization, being replaced by the boulevard 1 Decembrie 1918. Three graves were inhumations in stone cists, two of which had double-cists, and one cremation urn grave. In a double-cist, the first box contained an iron strigil, a ceramic *unguentarium*, and bronze rings deposited at the feet of the deceased. The second box held a gold necklace that closed in front with two animal heads (antelopes?), two gold earrings with a lion's head, a gold ring, and a bronze mirror. It is interesting to note that the second double-cist had a similar inventory: one box with an iron strigil, and a second with a gold necklace, identical to the one just mentioned, but incomplete, two gold earrings, also with a lion's head, but this time stylized, a bronze mirror and an *unguentarium*. If the double-cists can be attributed to a family, husband and wife, the resemblance of the inventory and the proximity of the funerary complexes suggest they were members of an extended family.

The third burial, in a stone cist, also contained a rich funerary inventory: a wreath on a lead frame with gilded-ceramic pearls, gilded-bronze leaves, ceramic flowers with four or six petals painted white and blue, with golden pistils; an iron strigil; a ceramic vessel and *unguentarium* (Preda 1966: 141, pl. 4). To the south of this tomb a three-sided construction was discovered; it measured 4.80 x 5.50 x 5.40 m, kept at a height of 0.40 m, which could only be an altar, especially since, near its western side, an incineration urn tomb was discovered – an amphora apparently being used as the funerary urn (mechanical levelling destroyed this funerary complex). Fragments of ceramic statuettes were also recovered from the area, as well as two ceramic medallions with representations of Dionysus and Aphrodite with Eros (Preda 1966: 144). This group of tombs was dated to the late 4th-early 3rd c. BC.

D5-6 In the courtyard of Magalia's High School No. 1, at the time of its construction, south of the ancient fortress, two inhumation graves in stone cists were discovered (Bârlădeanu-Zavatin 1980, 216-220). The first had as inventory: a ceramic hydria decorated with red paint (height 0.40 m, diameter 0.30 m); a ceramic *unguentarium*; a glass bead with three human faces and five small globular beads 'with eyes'. The second grave had a kantharos as an offering. Both graves were dated to the end of the 4th c. BC.

D7-22 Immediately south of Lake Mangalia, near the village of 2 Mai, a flat necropolis was investigated in a rescue excavation in 1974 during construction of the shipyard (Preda, Bârlădeanu 1979: 97-107). Sixteen tombs were discovered, of which twelve were by inhumation and four by cremation. These graves from 4th - 3rd c. BC are quite similar to all those located closer to the city. We present them as belonging to the city and so did the authors of the discoveries. The necropolis belonged probably to a settlement that served the harbour of Callatis. Eight were inhumation in stone cists, one of which consisted of a double-cist, and four were just dug in the rock and covered with limestone slabs. Cremation graves, in three cases had the calcined bones deposited in amphorae, and one in a *pythos*. The funerary inventory of these graves consisted of ceramic vessels (*unguentarium*, bowl, cup), a gold ring and an iron ring, a silver coin issued by Callatis (second half of the 4th c. BC), two bronze mirrors, three iron strigils, two iron knife blades. In one of the graves, in the double-cist a glass bead with three human faces was discovered (5.1 cm high, 2 cm diameter) (Preda, Bârlădeanu 1979: 104).

D23 A tomb with a funerary chamber covered with a semi-cylindrical vault was discovered in the same area in the early 1900s (Pârvan 1923: 123; Preda 1962: 56-158).

A stone construction, possible also an altar, was also discovered in zone D during the excavation for the future shipyard. It had three sides and measured on the outside 7.20 x 5.40 m. The wall had a width of 1.20 m. It was interpreted by its excavators as a house (Preda, Bârlădeanu 1979: 105), however, according to the discovery of similar constructions in the Callatian necropoleis of the Hellenistic era (Ionescu *et al.* 2002-2003: 225-276), it is more appropriate to consider it an altar or a cremation pyre, whose shape seems to have its origin in worship altars of the Archaic period (Whitley 2007: 138-139).

Conclusions

The construction types identified for the inhumation graves were mainly stone cists, sometimes double, tegulae cists, simple pits, sometime with *dromos* and niches blocked with walls built of unshaped limestone blocks with soil bonding. *Enchytrismoi* appeared as well. The cremation remains were either placed in urns or left on the pyres. Sometimes the urn was buried directly at the cremation site.

These graves were marked by funerary stelae. Al. Avram (1999: 151) presents the funerary stelae discovered at Callatis within four categories: 18 simple, rectangular stones dated to the 4th c. BC; three rectangular with relief, dated to the end of the 3rd c. - beginning of the 2nd c. BC; seven stelae with pediment and acroteria, without relief, dated to 3rd c. BC; and three with reliefs, dated to the 2nd c. BC.

The graves of the 4th-3rd c. BC from Callatis have a rich funerary inventory, deposited next to the skeleton, or in the funerary urn: water amphora, objects related to the daily toilet of the deceased, and jewellery or toreutic pieces representing deities or various characters. In general, the male graves had iron strigils and iron rings. Those of children and women were richer in offerings: small ceramic vessels for oils, or jewellery, Tanagra-type statuettes, and, for the women, daily toiletries – bronze mirrors, *pyxides* for cosmetics. Noticeable is a spread of ceramic discs with the face of a Gorgon. We have always called her Medusa, as she customarily appears in the literature concerning the Callatian necropolis, being the best known of the Gorgons (and her head, severed by Perseus, appears in various Hellenistic representations), compared to her other two sisters, Euryale and Stheno. The numerous Tanagra statuettes, often discovered in identical pieces, support the hypothesis of a local production centre functioning at Callatis (Canarache 1969: 37).

Topographically, the Callatian necropoleis located close to the ancient city consisted of systematized funerary plots of a maximum of 0.2-0.3 ha each, grouped around the defence system, from the valley of Lake Mangalia in the south (Preda, Bărlădeanu 1979: 97-107), to the resort of Saturn in the north (Bărladeanu 1977: 127-152). The most coherent spatial organisation pattern can be observed in relation to the roads leading out of the fortifications, two to the north (one on the coastal strip and another on the north-west corner), one to the west, and one to the south. The location and regularity in spatial arrangement of the graves denotes a clear continuity in use of the burial grounds, not only during the Hellenistic era but also later, as there is no particular case in which Roman graves were not discovered alongside Hellenistic ones. The altars or constructions of *escharon* type discovered to date demonstrate the practice of the ritual of commemorating the dead or heroes, as the case may be, at certain intervals after the funeral, or on the occasion of specific city holidays.

The groups of graves or tumuli located at appreciable distances from the ancient city, besides marking ancient roads, also suggest the existence of larger properties around the city (Ștefan *et al.* 2017: 80, fig. 26). The eventual extensions seemed to have been made to the detriment of agricultural land.

A group of Hellenistic period chamber-tombs in Callatis: challenging ancient identities

Maria-Magdalena Ștefan

The specific type of early Hellenistic monumental funerary architecture exemplified by the Documaci mound – chamber tomb assembled in excellent quality ashlar dry-masonry, covered by a barrel-wedged vault and marked by a large tumulus – was not the sole instance of the category found in the cemeteries of Callatis. Data on four other similar monuments have been published during the last century – ranging from simple notes (Tafrali 1928: 30-32) to brief reports (Preda 1962; Irimia 1984: 67-72). All these four tombs were found looted and partially destroyed in antiquity; three disappeared completely until the 1970s, with their positions only known approximately (Figure 20). Only T4 remains available for further inquiry today, having been targeted for a new research project, and preliminary geophysical investigation attempted, with detailed results to be published separately.[30] These tombs were all single-chamber, rectangular constructions; three of them had existing clues to suggest they were proceeded by *dromoi*. The lack of coherent inventories and insufficient context excavations meant that their significance remained rather unclear for a long time. Hence, the study of the Documaci Mound ensemble can be taken as potentially relevant for a larger group of monuments, connecting the dots of previous and disparate observations. In

[30] Dan Ștefan coordinated the geophysical survey, supported by Alexandru Halbac, Tomasz Bochnack and Kasia Showron.

return, our better understanding of the respective monuments clarifies that Documaci was not unique, even if the most exquisite, but part of a regional phenomenon. In particular, the studies which took note of these monuments placed them in the centre of a debate concerning ancient identities, by tending to see them as graves of tribal, 'non-Greek' leaders, either Thracians or Scythians.

The division of graves on the basis of richness, and especially the ostentatious architecture, into ethnic categories of natives versus Greeks, has actually been historically applied across much larger areas of the Black Sea coasts, in particular to the north-Pontic region. Challengers to this dichotomic view struggle to demonstrate the limits of reducing analyses to a single identity type, the reflection of which in the funerary domain is problematic to say the least, while ignoring, for example, political considerations or the material effects of social strategies (Petersen 2010). Without denying the existence of mixed populations living in the Greek cities or in their hinterland, we note, generically, that in times of social tension members of a certain group, any group, could adopt non-normative or more ostentatious styles of ritual representation (Kossack 1998).

T3

A large tumulus, already half destroyed by soil extraction, was excavated west of 2 Mai village, on the southern shore of Lake Mangalia, in an area of the necropolis (zone D in Figure 15), where another barrel-vaulted chamber tomb (Pârvan 1923: fig. 81; Tafrali 1928: 32; 1927: 18) was recorded in the early 20th c. (Figure 20/a-c). The research at T3 was conducted in 1961 by Constantin Preda, the archaeologist then in charge of the Callatis rescue excavation programme associated with the urban reconstruction of Mangalia. It remains to date the most coherent research and published report (Preda 1962) available for the group of Hellenistic chamber tombs around Callatis, other than the Documaci mound. T3 had a height of 5 m and a diameter of 60 m (E-W) x 66 m (N-S). As at Documaci, the diameter which did not contain the tomb was slightly larger. The tomb, consisting of a rectangular chamber and short *dromos*, was placed in the western margin of the mound, being orientated E-W. The chamber, measuring 3.18 m (N-S) x 3.0 m (E-W), had its vault partially collapsed. The short walls on which the vault rested were assembled of three courses each, placed over a plinth and overlapped by a slender impost (?) (Figure 20/e). The masonry was isodomic. The number of vault voussoirs cannot be restored. The chamber contained two rectangular slab cists, built under the floor and placed perpendicular to the entrance. The slab-lids had been removed during looting and the human bones were found scattered all around.

They slabs measured 2.13 m in length,[31] 90 cm wide and 0.92 m in depth. The inner face of these slabs were very finely carved. Similarly, the ashlars that made the tomb were characterized by quality stone working on their interior and fastening surfaces. So good was the join carving, remarked Preda (1962: 158), that the lines between the blocks were hardly distinguishable. The largest block measured, similar to Documaci, a little over 1.30 m in length. The width of the walls, as suggested by that of the blocks, measured between 42 and 65 cm.

The tomb was built in a pit excavated in an embankment pre-heaped to the level of the vault spring, at least observable in the vicinity of the *dromos*' southern wall (Preda 1962: 161, fig. 4). Inside this pit, layers of stone debris from the carving of the *in situ* blocks were recorded alternating with layers of soil. However, we notice on the same section drawing, the existence of a black level on which the wall plinths and construction monticules were placed, labelled as 'ancient humus'. This reminds us of the the 'zero level' with dark beaten clay at Documaci, but which we believe was brought in from elsewhere. The presence of this horizontal layer in T3, and the fact that the *dromos* was not sloping, nor stepped, make us consider that the T3 tomb (or at least its *dromos*) was built with foundation ditches for the walls (like Documaci *dromos* II), excavated in previously heaped lateral supports, but mainly on the same terrain level with the exterior cemetery. As at Documaci, this approach to establishing the depth of the inner floors in relation to the surrounding exterior terrain seems a hybrid variant of the Macedonian model, based essentially on underground constructions and the Thracian style of building above ground. The *dromos* was assembled in isodomic masonry (5.20 m x 1.2 m) of four courses, each of four blocks. Taking into consideration the plan (Figure 20/e), it was not built interlinked with the chamber, but attached. Its roof was not preserved: it could have been a gable roof of slabs, as one slab was found fallen inside. No groove was mentioned or drawn – as at Documaci – for fixing the slabs on top of the walls. Considering this, the roof could also have been a flat one. The *dromos* length seems complete, as the entrance blocked with boulders attests. The end blocks of the corridor were drawn trapezoidal – thickened in plan towards west. Both chamber and *dromos* had stone floors (according to the drawings). A 'stair' of five dimensioned stone blocks was found outside the *dromos*, very near to its northern wall and entrance (Preda 1962: 159, fig. 2/1). The available information about this structure does not allow a clearer interpretation of its purpose – a support wall, an access to the tomb from above?

[31] Close to the length of the interior space of *Kline*-Sarcophagus 1 at Documaci – the one covered by slabs fixed in a groove carved in the chamber walls; the groove measured 2.15 m in length (see Chapter 8, Figure 112).

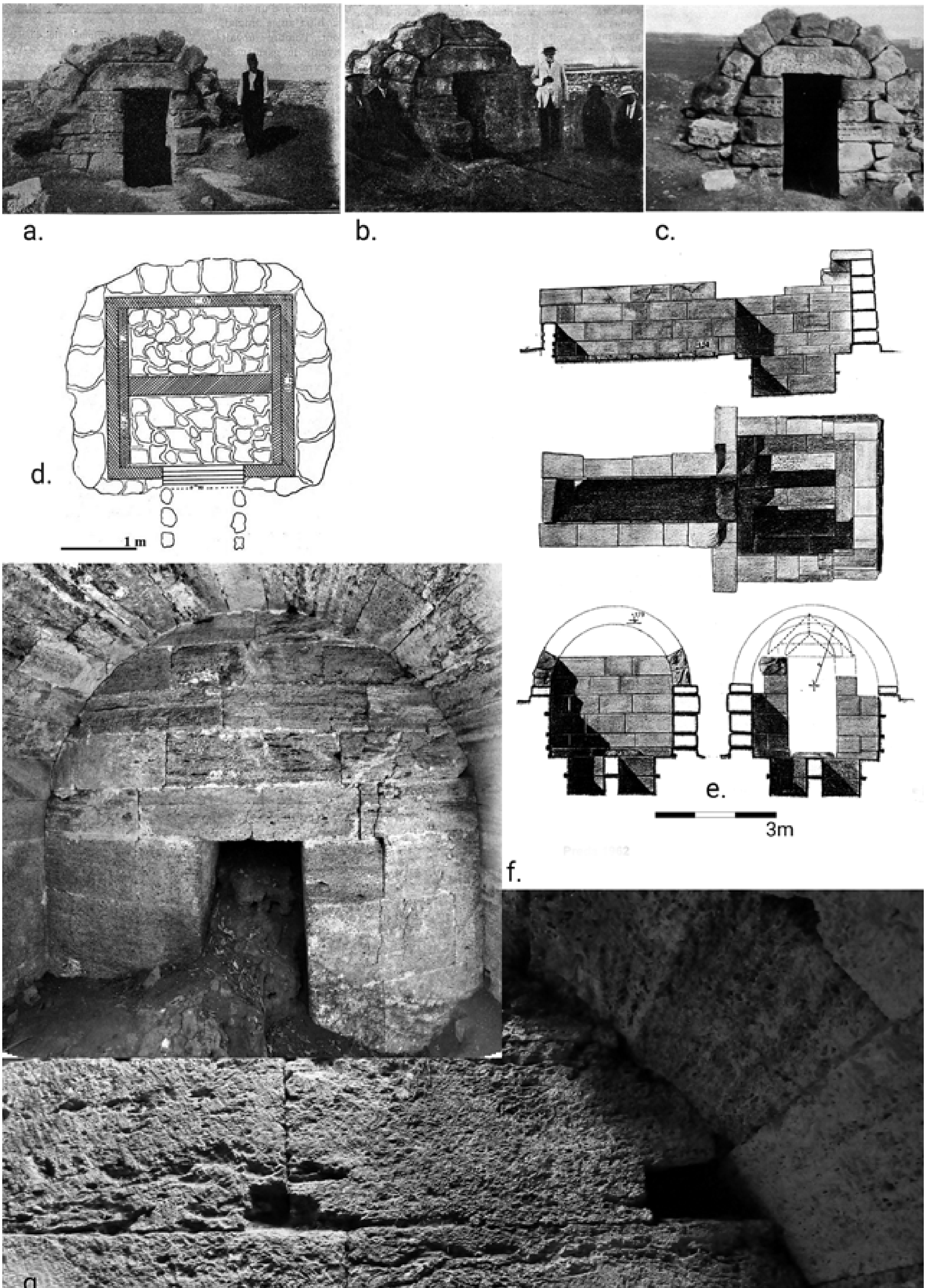


Figure 20. Chamber tombs with semi-cylindrical vaults around Callatis: a) T1 (Pârvan 1923: fig. 81); b, d) T1 Tafrali 1928: 30, 32); c) T1 (Preda 1962); e) T3 (Preda 1962: 165, fig. 7); f-g) T4 (photos by Al. Teodor, 2018).

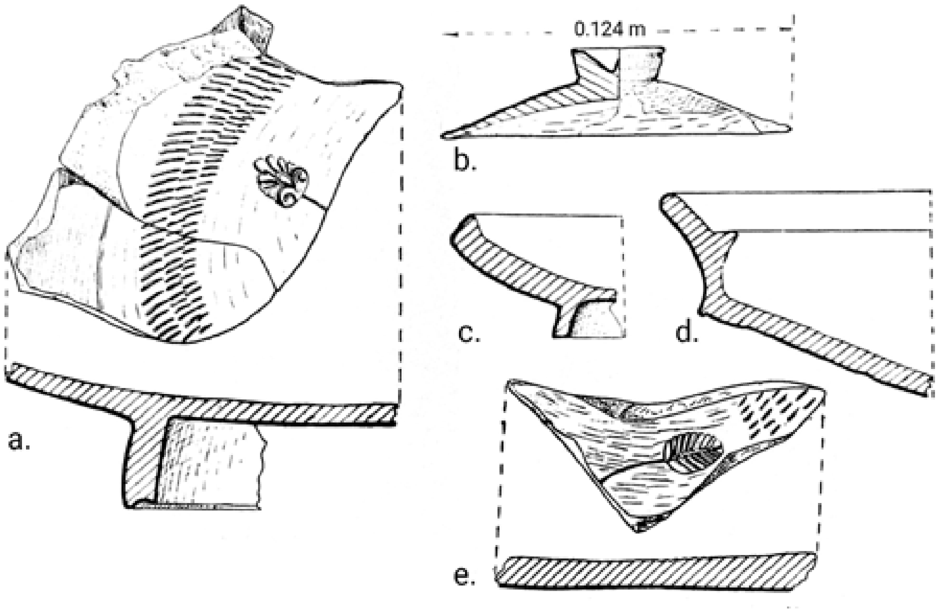


Figure 21. T3, pottery found in the construction pit for the *dromos* (after Preda 1962: 164, fig. 6).

We may note the family character of the tomb, as at Documaci and many other double-cist burials documented throughout Callatis (see Chapter 3.3, graves B.7-8, C.2, C.3, D.1-4). Cists built under the floors of Macedonian-type tombs are known from Nea Kerdyllia IV (Mangoldt 2012: 210-211), Amphipolis Kastas (Peristeri 2016), and Daphni-Elapochori in Thrace (Pentazos, Triandaphyllos 1976: 315-16, pl. 255). According to Tafrali's drawing, a pair of cists was very probably also in T1 (Figure 20/d).

The only found inventory in T3 consisted of shards of Early Hellenistic-period pottery (Preda 1962: 163-164, fig. 5-6) which were mixed in the building levels of the chamber, in the said pit, similar to the vessels found in the building layers of Documaci *dromos* II (Figure 69), also mixed with the back filling of the walls in the ditch for the walls. In T3 they were fragments of an amphora, lamps, lids, and black-glazed bowls, including with palmettes and rouletting (Figure 21) – almost identical to Documaci cat. C 1 in Chapter 12. The presence of the ceramics in the building layers of both tombs might imply a ritual explanation rather than utilitarian, considering that in both cases some of the pottery fragments had traces of secondary burning and were found together with remains of pyres. The general chronological interval for the pottery found in T3 is late 4th - first half of the 3rd c. BC.

Another significant aspect worth mentioning regarding T3 is the circular structure of the unworked stones observed by Preda (1962: 161) in the central part of the tumulus, already affected by soil extraction, which he considered a potentially older grave connected with the pre-heaped embankment; however there are no photographs or recordings of it on the plans. As the pre-heaped soils seem to be just two construction monticules, we wonder if the noticed stones were not the remains of a central pedestal, as at Documaci.

The potential area of discovery of this tomb and of T1 is still dotted with several large mounds (Figure 22). This group can be linked to an ancient settlement located on the southern shore of Lake Mangalia that served Callatis' harbour (see Chapter 3.2), now overlapped by the modern shipyard. The cemeteries organized around this habitation nucleus were part of the same larger urban area, even if located outside the polis fortification. The tumuli built on the high ridge bordering the lake to the south were directly visible from the city. T2, instead, was located much closer to the city defences, on the northern shore, even if as well to the south. An image recorded before the 1940s by Th. Sauciuc-Săveanu (Preda 1962: 167, fig. 8), places it in the vicinity of Mangalia's 'Small Mosque'.

T4

Briefly investigated in 1970 by A. Rădulescu, E. Bârlădeanu and M. Irimia, following an unauthorized excavation for the building of a temporary shelter (Irimia 1984: 67-72), the tumulus was rediscovered and revisited only as late as 2014. It is located 5 km north of the city's Hellenistic defences, in a position which is not visible from the sea, probably on a private ancient property situated in the vicinity of the ancient road leading to Tomis (Figure 22). Nowadays the tumulus belongs to the locality of Pecineaga, the closest village

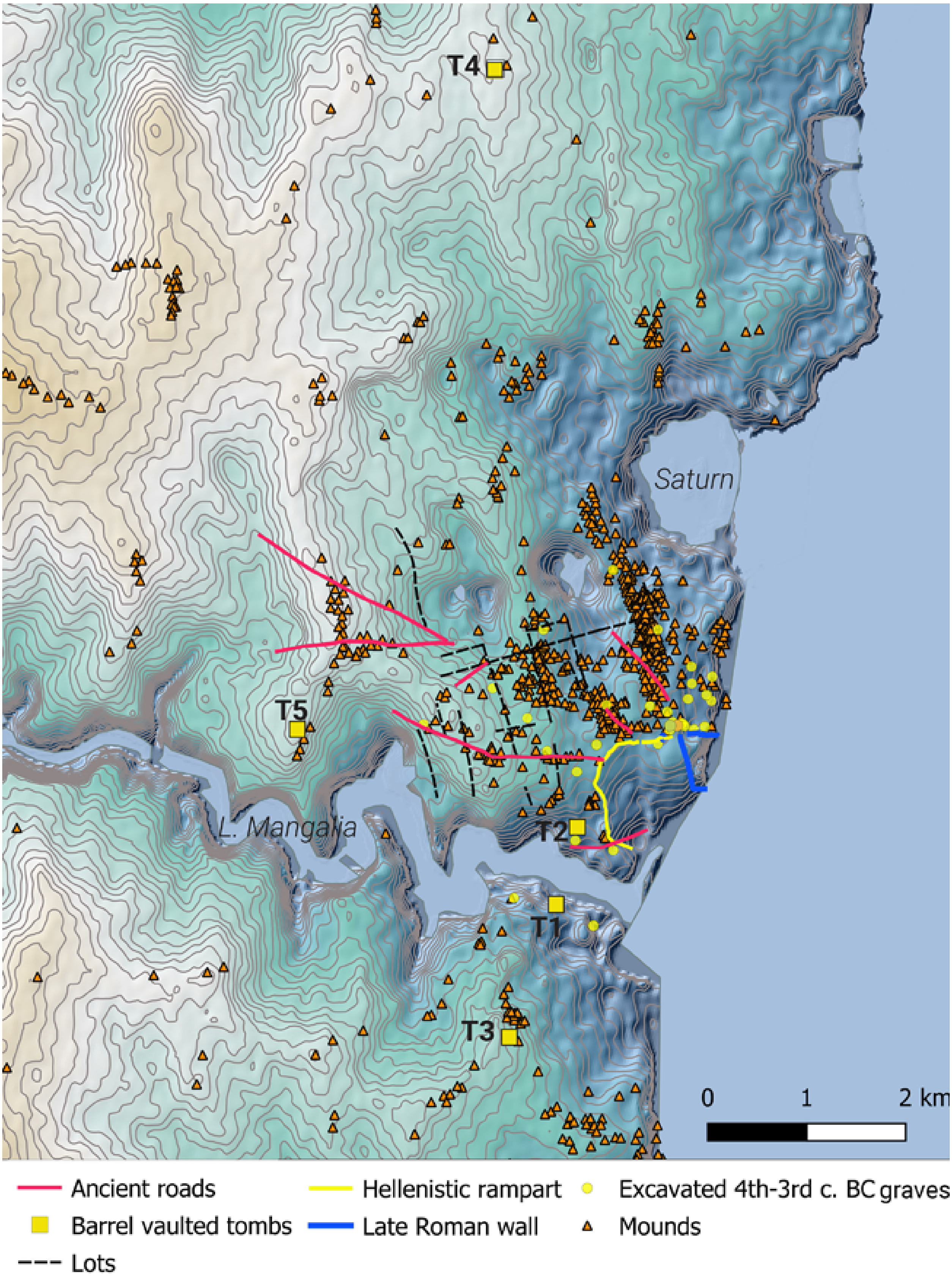


Figure 22. Necropolis plan with the location of barrel-vaulted Hellenistic chamber-tombs. The tumuli, ancient roads and plots delimitations were mapped from: historical maps, satellite imagery and, in particular, a German aerial image taken in 1944. T5 – the Documaci Mound.

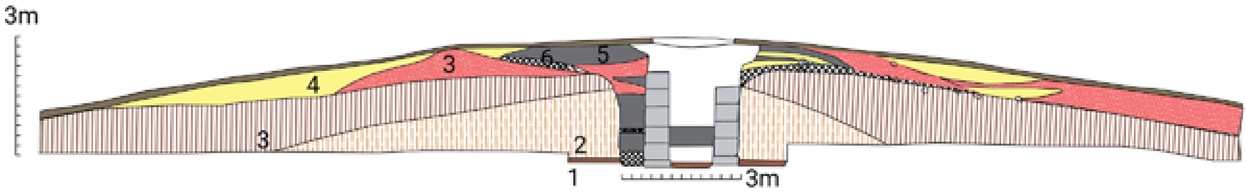


Figure 23. T3 (2 Mai), north-south profile through the *dromos* (after Preda 1962: 161, fig. 4): 1) ancient humus; 2) blackish brown; 3A) dark brown; 3B) yellow-red; 4) yellow; 5) soil with stones; 6) stone debris.

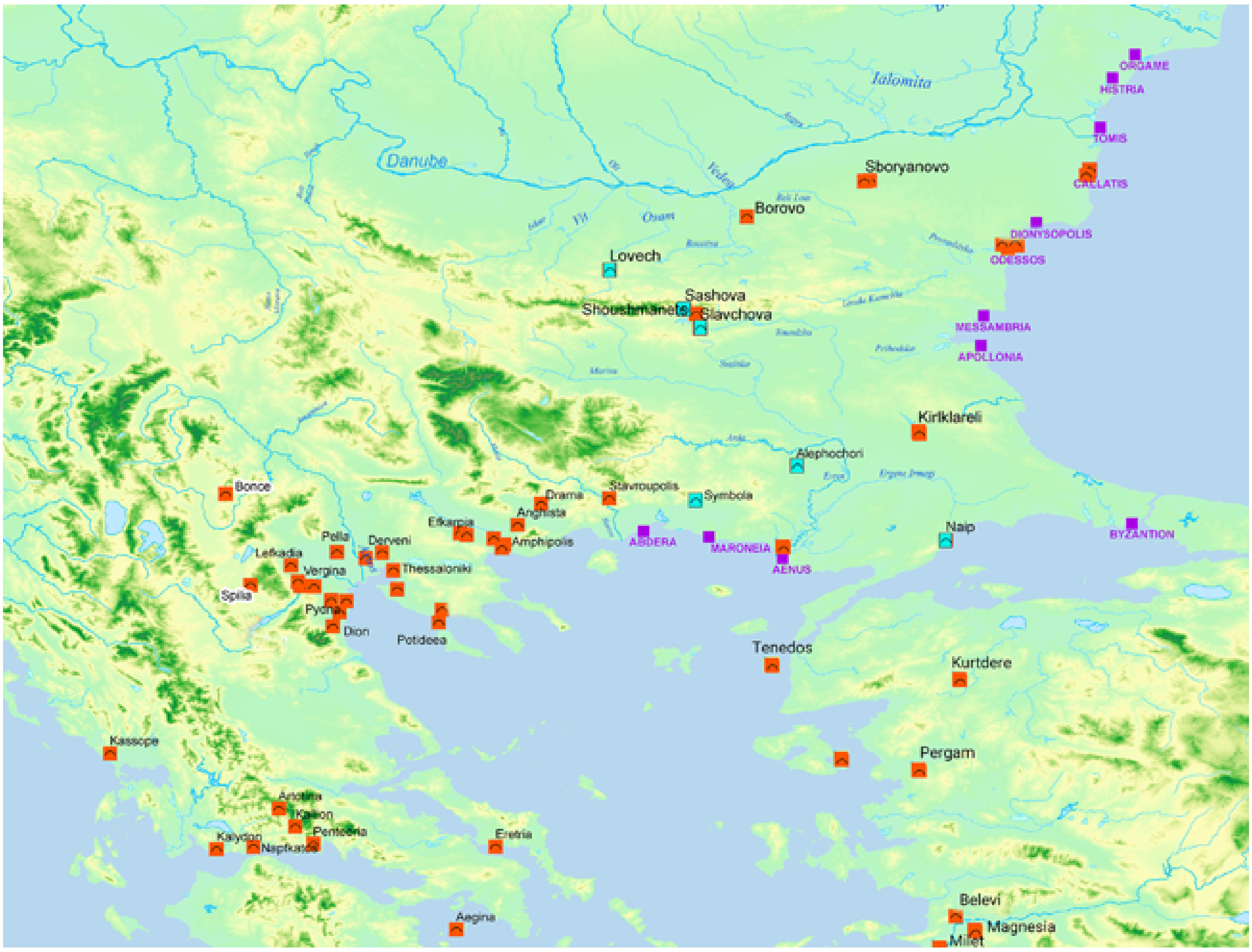


Figure 24. Early Hellenistic chamber-tombs with true barrel-vaults (red) and imitations (blue).

being Vânători. It is adjoined by at least two others, very probably forming a family burial ground. A Sinope amphora stamp of the last quarter of the 3rd c. BC was found at the base of its northern neighbour (*Movila Dulcești/Movila Comoroava*) – one the highest tumuli in the region of Mangalia, measuring 11 m in height. The single-chambered tomb in T4 is located in the western periphery of the 40 m in diameter mound. It was looted in antiquity, the looters breaking through the vault, taking out a couple of voussoirs, while the entrance remained blocked with stone boulders, as it was found by Irimia. The chamber measures 3.21 m (N-S) x 3.02 m (E-W).[32] It was built of limestone ashlars of a more porous aspect than those at Documaci. The rows had no uniform heights (measuring between 34 and 57 cm); the beds were not uniformly horizontal – in places step-joints and small stone pieces for filling gaps were observed. Overall, however, the joints were

[32] As hand-measured in the field by Al. Teodor and T. Bănică. Initially reported by Irimia as 3.03 m x 3.17 m. It is possible that secondary processes, i.e. walls sinking, caused a certain inclination, and, depending on where exactly along the walls one choses to record the measurement, there may well be differences of some centimetres. Future, more accurate measurements, by photogrammetry and total station, will follow, and these values might change.

tight, considering the high stone porosity, and the wall faces seem well aligned to the vertical. The longest blocks measured 1.81 m, 1.59 m and 1.32 m. Traces of plaster are still observable inside several joints. The rectangular openings in which the wood scaffolding for the vault was fitted can be observed on both long walls, in the upper part – two on the western and three on the eastern walls (Figure 20/g). The vault was assembled of 17 voussoirs of the same height as at Documaci (*c.* 49 cm). The entrance was in the middle of the western wall. It was reported as measuring 1.55 m in height. It had a slightly trapezoidal shape, 66 cm in the upper part and 70 cm in the lower part. The entrance was blocked on the exterior with three large, overlapped blocks, while a *dromos* was supposed, however, no excavations were made in that part, so nothing is known about it. The masonry is heavily affected by vertical cracks due to static loading. The most severe cracking can be observed underneath the lintel's margins (Figure 20/f), as at Documaci. Irimia reported a thin layer of mortar (less than 1 cm thick) which marked the level at which some materials were scattered, including human bones. It could be a plaster floor. The height of the vault to this level was reported to be 3.38 m. An approximation of Irimia's drawing with some hand-made measurements *in situ* seems to suggest that this could be in fact 3.21 m (as usual for a semi-circular vault, the height of which must correspond with the chamber width). Currently the level is under a consistent layer of soil (50-70 cm thick).

The most curious detail reported by Irimia, unverified yet, concerns the depth of the walls under the said mortar level – *c.* 90 cm – two and a half courses – which were carved only roughly and were projecting several centimetres towards the interior. It sounds to us more probable that these walls had to be connected with destroyed underground cists, like in the tomb at 2 Mai. Of course, further excavation is needed to test this possibility.

Several fragmentary objects were found by Irimia in 1970, scattered in the chamber, now deposited in the Constanța Museum. Among them we may mention a wheel-made ceramic lamp (Figure 25/a), 10.8 cm long, with spheroid body, double-convex angular profile, very slightly concave foot, flat top, short collar rim surrounded by a groove, pink fabric, covered in brown lustreless glaze; long nozzle, rounded end. It was found fragmentary, but it seems it had a lug attached on its right side (solid, not pierced? – not clear due to reconstruction); Iconomu (1967: 8) frames his type IV widely – 3rd-2nd c. BC, however Howlands has close shapes (1958: 94-96, type 29A), dated last-quarter of the 4th c. BC or first half of the 3rd c. BC; the same earlier interval for an item with a similar profile from Callatis now in the Brăila Museum (Topoleanu, Croitoru 2015: 62-65, nr. 9, 10). Later 3rd c. BC was proposed for specimens with raised rim by Howland (1958: 99-101, type 32).

Among numerous fragmentary iron objects, a small one-bladed knife (preserved length 6.8 cm) was identifiable, as well as a 13 cm long nail with rectangular section (from wood coffin or furniture?), and fragments of a possible spearhead (?). 105 iron, three-bladed arrowheads were found in groups, blended together due to corrosion (Figure 25/b-d). They were probably part of a quiver and have pyramidal tips and long protruding sleeves, measuring total heights of between 4.2 and 5.4 cm. While quivers are often found in the 5th-3rd c. BC rich tombs of Thrace and the north-Pontic area, in the graves of the west-Pontic poleis, weapons remain an exceptional choice of inventory. In the region around Constanța (Tomis) we know of two other funerary complexes with arrowheads of the same type as in T4, only in bronze (Irimia 1984: 70, fig. 4/7-26). The triple flat burial at Constanța (the oxygen factory), seems to involve an indigenous old tradition of placing a stone slab at the deceased's feet, indicating a probable non-Greek origin of the family. In both funerary contexts, additional materials, especially the Chersonesus amphorae found at the oxygen factory site, and Thasian amphorae at the tumulus at Cumpăna, suggest a local spread of the previously mentioned arrowhead type (in bronze) in the late 4th - first half of the 3rd c. BC. Iron arrowheads appear in the second half of the 4th c. BC, becoming increasingly common, at least in the northern Black Sea region, starting with the 3rd c. BC and in the 2nd c. BC (Meljukova 1964: 18-29). At Glinoe, for example, a cemetery on the left bank of the Dniester, the majority of graves (93) have iron tips of similar morphology to those in T4 (Telnov *et al.* 2016: 772-774). They are dated 3rd-2nd c. BC. The quiver set in T4 could be locally made.

Macedonians, however, did place at that time weapons in their tombs, even if, starting with the Classical period, the practice was tempered under general Hellenic trends (Lane Fox 2011: 4; Hatzopoulos 2011: 54). Macedonian-type chamber tombs under tumuli are often found looted. From the few that were untouched, the tombs at Vergina in *Megali Toumba* and at Derveni contained extensive sets of weapons and armour. The quiver set found in the chamber tomb traditionally assigned to Philip II at Vergina, which included 74 bronze three-lobed arrowheads of various sizes, is particularly famous. Archery and artillery were important features of Macedonian armies during sieges, as the finds at Olynthus attest (Robinson 1941).

The ethnicity issue – a historiographical concern

The funerary model exhibited by the barrel-vaulted chamber tombs around Kallatis has been perceived as being in obvious contrast with the normative burial

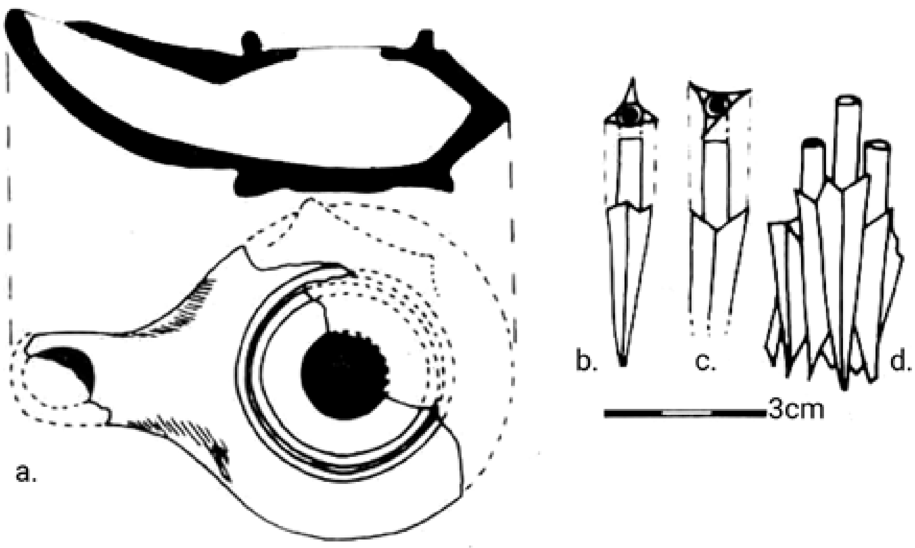


Figure 25. T4, inventory: a) lamp; b-d) iron arrowheads (after Irimia 1984: 68, fig. 2/7-10).

practices of a democratic Greek city – too expensive and ostentatious, too monumental (thus royalist), too far away from the city, without precursors or analogies in the rest of the city's graves – thus not belonging to the community. In addition, weapons were found. The discrepancies were habitually explained in an ethnic framework (Condurachi 1951; Florescu *et al.* 1980: 214; Irimia 1984). Those buried in the chamber tombs had to be non-Greek – either Thracian mercenaries in the service of Callatis (Oppermann 2004: 165), or Scythian kings ruling over the city (Preda 1962: 170-171; Irimia 1984: 170-171; Avram 2006: 70), while the masonry and architecture were accepted as obvious Greek (Pârvan 1923: fig. 81; Preda 1962: 169). In particular, the Scythian theory was the most favoured, as it seemed to match best those ancient sources mentioning a Scythian population in the southern Dobruja area during the 4th-2nd c. BC (Pseudo Skymnus 756-757; Pliny the Elder, *Nat. Hist*. IV, 44). The second argument, regularly invoked, was the famous series of bronze coins found between Tomis and Dionysopolis, bearing the names of Scythian dynasts paired with the title 'basileus'. These were issued in Greek cities on the western Black Sea coast (Callatis amongst them) and were contra-marked, meaning they were included in the cities' economy. One of the interpretations is that they attested a sort of Scythian control over the *poleis* and the existence of a ruling group – rich and powerful enough to build monumental tombs. Several chronological intervals have been proposed for the bronze coins bearing the names of Scythian *basilei*, ranging from the 3rd to the 1st c. BC; taking into consideration the situation of the west-Pontic minting centres, the latest researches on iconography and weight standards support the variant of the 2nd-1st c. BC (Talmaţchi, Andreescu 2008: 461 with bibliography on the subject).

Preda (1962: 170-171) at first, Irimia (1984: 81-82) following, observed the analogy with the Macedonian-type tombs, but only as the beginning of a long series (of barrel-vaulted tombs), with specimens built in the area until the Late Hellenistic period and even in Late Roman times. More examples were given, regardless of constructive type, of chamber tombs built during the Classical period in Thrace and the northern Black Sea area. This contributed to developing a perception of them having a weak connection between the Callatian series and the Macedonian examples, by dismissing too easily the chronological, constructive, and ritual clues which made them, in fact, to overlap. This explains perhaps the perception as negligible of the chronological discrepancy of more than a century between the construction period of the tombs and the 'Scythian coins'.

Preda and Irimia, the principal excavators of chamber tombs around Mangalia, admitted two interpretative possibilities: either the tombs belonged to leaders of the Callatians or to chieftains of tribes (Thracian or Scythian) who lived nearby and became accustomed to Greek practices. Preda emphasized specifically the second possibility, even if he admitted that there were no categorical arguments for either of the directions, while Irimia appeared very certain of the Scythian elements, connecting them to the presence of the quiver in T4, an ensemble he tended to date as too loose and too late.

This ethnic interpretation had remained practically undisputed until recently (Damyanov 2010; Ştefan, Sîrbu 2016; Ştefan *et al.* 2017), when the focus has been placed instead on the social and political relevance of the discussed funerary ensembles, regardless of which ethnicity the commissioners had, by reinforcing the impact made by the Macedonian kingdoms during the time of their construction, while exerting political pressure upon Callatis through garrisons, governors, or by financing indirectly secondary stages of conflict between Alexander's heirs.

A similar historiographic situation appears to involve the series of five Early Hellenistic chamber tombs found around the Milesian colony of Odessus/Odessos (Varna, Bulgaria), 80 km south of Callatis. At Odessus, too, the chamber tombs, covered by semi-cylindrical vaults of trapezoidal carved blocks, and in fact tumuli in general, were regarded up to a certain moment as non-Greek, in this case as Thracian graves (Mirchev 1958). This interpretation was thoroughly dismantled by Damyanov (2010), who criticized the narrowing down of earlier analyses to just single sites and by emphasizing the need to set them against the background of wider phenomena. He was the first to connect the tombs of Odessus (and indirectly of Callatis) with Macedonian garrisons, evidencing the good chronological overlap, as the Odessian tombs delivered more coherent inventories, datable to the late 4th - first half of the 3rd c. BC. He also argued that rich citizen families existed both in Callatis and Odessus, attested by epigraphic sources which mentioned sponsors, and by several other graves exhibiting wealth and a taste for luxury, even if not necessarily in architecture.

Chamber tombs around Odessus (Figure 26)

1. Eshil Tepe (Figure 26/c-1)

In 1892, during the construction of the Girls' High School, the Eshil Tepe mound was affected, under which a tomb was discovered built underground, of which only the vault was on the surface (Mirchev 1958: 571-572, fig. 2; Shkorpil 1898: 50-51, fig. 11). The site is about 0.5 km north of the ancient city. The rectangular burial chamber, 2.77 m long, 2.58 m wide, 2.80 m high, was covered with a semi-cylindrical vault. The room was oriented south-north, with the entrance to the south; the *dromos* measured 2.80 m in length and 1.70 m wide, was severely affected. Data on how it was covered is missing. The entrance to the funerary chamber was 1.40 m high and 0.93 m wide, raised off the floor by 45 cm and sealed with 3 stone blocks. Both rooms were built of rectangular limestone blocks, 1.30 m long, 0.50 m wide and 0.45 m high, without binders. The floor in both rooms was made of beaten clay. In the northwest corner was a stone bed, 1.25 m long, 76 cm wide, and 40 cm high. Other details about the bed are missing, except for the information that the outer sides had a border. There was a poorly preserved inhumation in a wooden coffin, reinforced with 12 cm long iron nails and decorated with bone ornaments. The inventory objects (Ivanov 1956: 105-108, pl. IV-VIII) arrived at the Archaeological Museum in Sofia in 1893: two Thasian amphorae, four lamps, two *askoi*, *kantharos*, three *unguentaria*, one alabaster, terracotta, and glass elements of a funerary wreath. The material can be dated generally as late 4th c. BC - first half of the 3rd c. BC, but more probably in the early 3rd c. BC, especially taking into consideration the lenticular *askos*, associated with the Thasian amphorae.

2. Intersection of Kliment and Odessos Streets (Figure 26/c-2)

A tomb was discovered in 1929 at the intersection of Odessos and Kliment Streets, just north of the walls of the old city of Odessos. The tomb was built of well-finished limestone blocks and had a semi-cylindrical vault. The entrance was facing southwest. No further details have been preserved, except for a photograph (Shkorpil 1930-1931: 78, fig. 61), in which the vault is clear, made of 17 trapezoidal blocks.

3. Monument of the Polish-Hungarian King, Vladislav Varnenchik (Figure 26/c-3)

In 1932, on the construction of the monument dedicated to Vl. Varnenchik, two mounds were explored. One contained a tomb completely buried in the ground; it consisted of a burial chamber and a *dromos*, oriented north-south. The *dromos* (1.65 m wide, the preserved length being 5.40 m), built in the southern part of the tomb, was disturbed following an ancient intrusion. The height up to the first stone of the semi-cylindrical vault was 2.25 m. The *dromos* was slightly raised to the surface in its southern part. The chamber had an entrance 2.15 m high and 1.03 m wide (in 1958, Mirchev mentioned that the upper part was missing, being incorrectly reconstructed from cement). On the outside, the entrance was decorated with a narrow, embossed frame. The burial chamber had an almost cubed shape, with a side of 3.05 m and a height of 3 m, covered with a semi-cylindrical vault and built, like the *dromos*, of rectangular limestone blocks, not bound with binder, placed in regular rows. The blocks measured 1-1.24 m in length, 31-42 cm high, respectively 0.48 m thick. Under the clay floor the walls have a single row of limestone blocks, representing the foundation of the building. These blocks, as well as two others in the first row in the south-eastern corner, were processed in a rustic style, suggesting something was attached here on the wall. An irregularly shaped limestone block (1.05 m x 0.48 m x 0.37 m) was found inside the tomb. On the upper part, two ovoid depressions could be observed, with a smooth surface, 12 cm deep and a width of 30 cm. The purpose of the stone remained unknown, perhaps it was part of a funeral bed. In the tomb, an early 4th c. BC Attic *aryballic lekythos* with red figures (Toncheva 1953: 33, fig. 49) was found – an heirloom – and terracotta figurines.

4. Akchilar (Figure 26/c-4)

In 1927, a stone tomb built of shaped limestone blocks, oriented east-west, was accidentally found under an isolated and almost flattened mound, 3.4 km north-east of Odessos, near the road to Dionysopolis (Mirchev 1958: 574-5, fig. 5). The tomb had a rectangular plan and dimensions (3.35 m x 2.50 m x 2.67 m). The chamber was covered with a semi-cylindrical vault built of 11 rows of cut, trapezoidal blocks. The tomb had no *dromos*; the entrance, fitted directly into the western wall (1.45 m high and 1.06 m wide), was blocked by four stone blocks built on top of each other. The door opening was positioned to the south of the centre of the wall so as not to damage the wooden coffin inside. The blocks from which the walls and the vault were assembled had the same thickness, respectively 50 cm, while the lengths and heights varied (1.76 - 0.56 m and 0.60-0.35 m respectively). The vault blocks were shaped only on the inner surface. Likewise, the wall blocks were shaped on the exterior only in the area of the facade. In two of the voussoirs, four coarse connecting metallic spurs were observed. The tomb was looted. With the exception of a few ceramic fragments, traces of a wooden coffin, or most probably a *kline*, had been identified near the northern wall. The wooden furniture had animal-shaped legs, sadly destroyed when the tomb was opened. Several terracottas were recovered.

5. Evksinograd

In 1935, in a vineyard, on the left exit of Evksinograd Park, a tomb was discovered under a flattened mound (Mirchev 1958: 574-575, fig. 5). The tomb (2.50 m x 1.25 m x 1.35 m), oriented north-south, was built of limestone blocks and covered with a semi-cylindrical vault. Other construction data are missing and the grave no longer exists. As for the inventory, the finds included a lamp and several black-glaze vessels.

Community membership and social strategy

The two series, from Callatis and Odessos, represent a coherent group sharing features regarding the spatial relation with the cities' burial grounds, the employed constructive techniques and chronology of their construction period. The available inventory for Eshil Tepe at Odessus secures it in the late 4th - first half of the 3rd c. BC interval. The same period is covered by the vessels found in the construction pit for T3 at 2 Mai, and, as will be detailed later, by the discoveries at Documaci. The *lekythos* in the tomb at the Vl. Varnenchik monument is earlier, but it could be an heirloom. T4 at Pecineaga might be the latest, with the lamp and iron arrowheads that could be dated also to the second half of the 3rd c. BC. Beyond similarities, it is also important to stress that the ten tombs were not all of the same craftsmanship, size and detail – they varied, exhibiting differences in resources in what appears to be, generally, a rich social group. Amongst them, the Documaci mound stands out through the quality of the project and complexity of the ritual components.

Preda's and Irimia's previous statements that these tombs were located at distance from the city seem based only on impressions correlated with a previous lack of systematic mapping of the ancient cemeteries. Both at Callatis and Odessos, some tombs were located only 100 m - 500 m from the fortifications of ancient cities, thus unmistakably part of the urban burial grounds, others were situated further away (1 to 3 km), at the margin of the funerary lots, but not outside the funerary space, still directly visible from the city. In fact, the marginal positions were rather associated with a search for a dominant topography (see the examples of the Vl. Varnenchik monument and Documaci). A few, indeed, were located over 3 km away, along the main ancient roads, but always alongside other tumuli, forming family burial grounds, very probably on the private estates of rich families living in the territory.

The monumentality exhibited by the series was not completely uncharacteristic of the surrounding burial grounds. Both Callatis and Odessus had extensive tumuli necropoleis. Callatis had a vast one, established from the 4th c. BC and used throughout the entire Hellenistic period. Over 380 mounds were still visible only in the area occupied today by modern Mangalia, in 1944, when German planes made a reconnaissance flight over potential Romanian bombing targets (Figure 2/b). Since then this area of ancient cemeteries has been completely levelled, with only very little archaeological documentation to compensate. Even if they contained mainly basic stone cists, simple pits and occasionally cremation graves, what singled them out was their large size (2 to 5 m in height, occasionally, and from 25 to 70 m in diameter) and organized spatial spread. The northern sector of the cemetery aligned to the road leading to Tomis was particularly imposing – exhibiting multiple parallel rows of aligned and systematically spaced huge mounds. This was clearly an outstanding monumental funerary landscape. The organized funerary space suggests that this was a sector reserved for citizens. We can also assume that commemorative stelae were placed in the vicinity, or on top of some of these mounds. Almost 700 mounds were mapped over a radius of 5 km around the Hellenistic fortification. The radial distribution of these mounds and coherent spatial coverage suggest that they were directly linked to the *polis* and its adjacent facilities – harbour, settlement serving the harbour, depots, market, and so on – not necessarily inside the city walls. The spread of mounds around Callatis and Odessus sustains the idea of a densely occupied territory over a 5 km radius around the ancient cities, on both sides of the harbour estuaries, at least for the late 4th-3rd c. BC. The

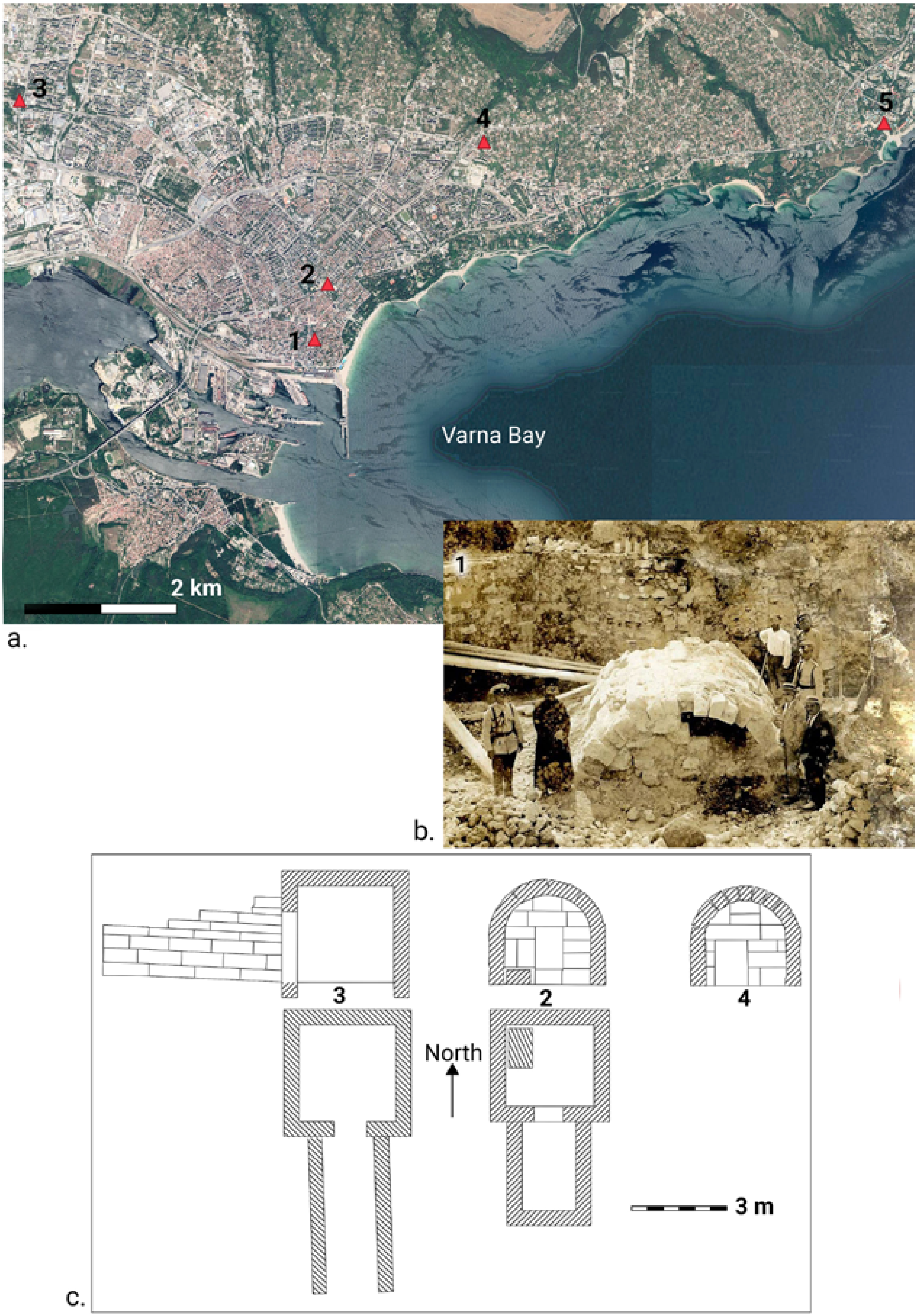


Figure 26. Varna city and barrel-vaulted tombs near Odessus (map after Mirchev 1958: 72, fig. 1): b) T1 (tomb at the intersection of Kliment and Odessos Streets (after Shokrpil 1930-1931: 78, fig. 61); c) (after Mirchev 1958: fig. 2, 3, 4): 2 – Eshil Tepe, 3 – Monument Vladislav Varnenchik, 4 – Akchilar

chamber tombs were thus not isolated monuments, but an integral part of the funerary landscape of the *chora*, in direct relation with the roads. Monumentality was an essential part of funerary practices in both cities, including for the citizens.

The chamber tombs of Callatis and Odessus we have been discussing belong to the so-called Macedonian-type category of tombs, without decorative facades or architectural embellishments. They were all covered by mounds, and employed true arches and vaults made of voussoirs; the masonry was dry, stone plinths were used under the walls, and construction blocks were carved on the interior and contact faces. A rusticated style was applied to those parts of the walls to which other elements could be attached (beds, cists) – T4 near Pecineaga, Documaci, and the tomb at the Vl. Varnenchik monument. In two cases metallic connecting elements were documented (Documaci and Akchilar). In general, the rows were regularly spaced. Entrances in the *dromoi* or chambers were blocked with overlapped ashlars (T4 and T3 at Callatis, Eshil Tepe and Akchilar at Odessos). We notice, in particular, the similarities in approaching the composition of the funerary space (always one chamber, rectangular or almost square, paired at six of the ten sites with *dromoi*) and the proportions of the constructive components (chambers around 9 m^2, *dromoi* around 5 m in length). The closest analogy for the Documaci tomb is the structure researched at the site of Vl. Varnenchik – in both cases the *dromos* (*Dromos* I at Documaci) was vaulted, built in isodomic style, slightly sloping towards exterior, and deviating slightly from the chamber axis. T3 at 2 Mai and the Documaci mound both share the feature of being built on a beaten construction level, not too low in relation with the surrounding necropolis terrain, with the walls for the *dromos* placed in trenches excavated in construction monticules built prior to the masonry. Both had mixed in the construction layers associated with the stone carving for the *dromos* – broken pottery and elements of pyres. Of the Vl. Varnenchik tomb, Mirchev says that it was built completely below ground, however, the corridor was only slightly raised towards the surface. This calls for a nuancing of previous statements (Stoyanova 2007; Ștefan, Sîrbu 2016), that the tombs at Callatis and Odessus followed the Macedonian model of underground constructions, but rather, as Documaci and T3 at 2 Mai also suggest, the tombs were a variant of the Macedonian design, implementing only small depth differences. For Eshil Tepe, the information available is that the chamber was underground until the vault springing. All in all, the good technical execution of the stone dressing, and especially of the vaults, both for chambers and *dromoi*, shows the involvement of specialized architects and masons with previous experience. There are no copies, or experimentation, as in southern Thrace. A local adjustment of the original designs to the geological and topographical realities is also evident.

There are analogies with the rest of the surrounding graves. As a group features, the tombs at Odessus were characterized by preferential use of wooden funerary biers (or coffins), decorated with ivory elements (Eshil Tepe), similar to other finds at Odessus (Toncheva 1964: 56-9), while at Callatis, the predilection was for double-cists under stone floors – a common feature with the local funerary environment. In this way we notice that the idea that no connection existed between the chamber tombs and the rest of the graves in the cities necropoleis is not true. At Documaci, the connection is even more obvious, with the use of a stone altar adjacent to the western part of the *krepis* wall, as at other sites in Callatis. For the chamber tombs at Callatis, in three cases we can suppose the use of a plaster finish on the walls (Documaci, T4 and T1).

As for family tombs, T3 and T1 at 2 Mai (with double-cists) and at Documaci (two *klinai*) were designed from the start to accommodate family groups. They were double-burials, but which could house in the end even more individuals, placed subsequently in the same cists/sarcophagi. This family feature is quite common for the Callatis necropolis. Double-cist burials were traditional, as was the prolonged use of the tumuli as places for repeated burials. The organisation of the funerary space in a regular grid is also connected with lineage and rights of inheritance – citizenship and land ownership were related with the preservation of family burial grounds, with T4 at Pecineaga located in a burial ground, together with other tumuli, amongst which one was truly monumental (and still unexplored). The ritual offerings connected with Documaci attest a commemorative activity which lasted for a half a century after the burials. What results is that some of these families who commissioned the monuments continued to live in the same area, most probably in the city, or on their surrounding estates. The type of ritual offering, as we will see later, was characteristic of the necropolis and the Pontic area in general.

There was also an element of political statement. The coins found with the names of Scythian kings are more than a century later than the building period of the chamber tombs in Callatis and Odessus. While Preda (1962: 170) recognizes this chronological difference, he postulates that, probably, comparable relations between Callatis and leaders of the tribes living in its vicinity must have existed also in the decades before Kanites, Charaspes, Sariakes, and others. Nevertheless, after the defeat of the Scythian king Atheas by Philip II, and in the context of north-eastern Thrace becoming a busy theatre of war, seeing the frequent movement of Macedonian troops (during the two episodes of the

Callatian Revolt, the wars between Lysimachus and Dromichaetes, but also as launch pads for campaigns into Asia Minor) it is highly improbable for Scythian dynasts to rule over Callatis or Odessus, building royal burials in urban cemeteries. The numismatic picture of the period is also quite relevant, emphasizing the extent of Macedonian political conflict, in which the west-Pontic cities became secondary stages of confrontation, for the larger wars waged for pre-eminence, following the death of Alexander the Great. There are no significant indigenous settlements located in the hinterland of either of the two cities, even if evidence for a mixed population is not lacking. A tribal chieftain, either Thracian or Scythian, is in any event what the name says – a leader of a tribe/a community. He would not build in advance a tomb for himself (and his family) in the vicinity of a Greek city as simply as that, far away from the settlements he, or his family resided in. Any dynast, regardless of ethnic origin, prepared his grave in the vicinity of the community he ruled, near the residential centre where his family lived, where his ancestors were, or, especially, his successors. The clear example is Sboryanovo, 110 km north-west of Odessus and 140 km south-west of Callatis, where an indigenous city of Hellenic style was developed, beginning from the last quarter of the 4th c. BC. Four chamber tombs, all covered by barrel-vaults, were found in the tumuli necropoleis surrounding the city (Gergova 1996; Chichikova *et al.* 2012). They all exhibit very fine craftsmanship and the involvement of Greek architects. The tombs here were built on the level terrain and had no *dromoi*. The rituals associated with them, e.g. body dismemberment or horse burials, were nevertheless of local tradition.

In terms of the general background of Late Classical/ Early Hellenistic increases in ostentatious funerary behaviour in Asia Minor, Macedonia, Thrace, and the Black Sea basin, i.e. with chamber tombs under tumuli built in a variety of models, barrel-vaults, especially earlier, were specifically associated with Macedonian elites, with veterans and their families, and with their military associates. The implementation of barrel-vaults and true arches assembled of voussoirs are two of the architectural innovations of the last third of the 4th c. BC recorded, in the earliest known instance, at a tomb found near the symbolic Macedonian capital of Aigai (Vergina, the 'Tomb of Eurydice'). This innovative roofing solution allowed the covering of larger underground spaces – a tendency which was already characterizing Macedonian funerary models by the 4th c. BC. The barrel-vault became one of the essential features of the so-called 'Macedonian-type' graves, alongside the use of facades to conceal the vaults, stepped access corridors, underground chambers, the use of interior stone funerary furniture, and illusionist decorative finishing of the walls in plaster and paint.

A political dimension of the funerary design (in fact access to new technology) is suggested by the situation in Thrace, where an earlier funerary tradition (based on tholoi) was not exchanged for barrel-vaults, in particular in those areas with older practices of social and political cohesion. The very few examples found in southern Thrace are rather unsuccessful copies of the original vaulted model, while in central Thrace, dotted with tholoi, the three known cases of barrel-vaults were all grouped around a strategic passing point (Shipka), through the Balkans to the north, and were in any event mixed in what were essentially local designs. The greater spread of Macedonian-type tombs in north-Balkan Thrace (four at Sboryanovo, one at Borovo, one at Lovech), rather than in the southern areas, could be explained precisely in the context of a situation where, in the north, there was no previous systematic tradition of dressed stone architecture, the centralisation of power being more recent, all corroborated with Lysimachus' intense diplomacy of the early 3rd c. in north-eastern Thrace, when war alliances, peace treaties and negotiations were sealed with gold coins and marriages, or borrowing army engineers to fashion defences, or, why not, to build tombs.

Indeed, the building of chamber tombs involving such new technology (like true arches and real vaults), which was developed and much favoured in the circles of the high dignitaries of the militarized Macedonian elite, cannot be paired easily with a democratic Greek city. But the explanation is simpler seen as social and political difference, not ethnicity. If viewed as more than just at the scale of Callatis, or Callatis and Odessus, the discrepancy can be paralleled with several other examples where rich tumuli chamber tombs appeared in necropoleis of Greek cities, starting from the end of the 4th c. BC and throughout the 3rd c. BC, and where no Thracians or Scythians ever lived, for instance on the islands of Aegina (Miller 1993: pl. 8/c) and Euboea (Hugenot 2018), but where Macedonian garrisons were active during the wars of the Diadochi.

As a conclusion, we can stress once more the evidence that the commissioners of the barrel-vaulted chamber tombs in Callatis and Odessus appear strongly associated with the communities living in the cities throughout the 3rd c. BC, especially in the first decades. They were families, not individuals; they were rich and connected to the artistic trends of the day, practising commemoration rituals for several decades at their graves. They could be rich families supporting the Macedonian political parties (followers of Lysimachus, or the Antigonids, or the Ptolemies later), and even mixed families, who flourished around members of the Macedonian garrisons stationed in the cities, at least in the very late 4th and early 3rd c. BC.

Documaci Tumulus

Chapter 4
The Place

Topographical position: localisation inside the cemetery

Maria-Magdalena Ștefan and Dan Ștefan

The Documaci mound is currently located at 2 km west of the neighbourhood of Coloniști, on Mangalia's ever-growing periphery, between an agricultural field to the west and the firing range of a military base to the east (Figures 2; 22; 27; 29/b; 30). In antiquity, the tumulus site was *c.* 3 km in straight line from the Hellenistic city's western gate. Following a route that is now well over 2000 years old, the county asphalt road exiting Mangalia towards the west, towards Albești (DJ391), passes *c.* 600 m to the north of the mound. What has remained of the original embankment after years of looting, destruction, and excavations represents, at most, a quarter of the original volume, rising now to a maximum preserved height of only 6.4 m (Figures 56; 58). The presence of a neighbouring military firing range, enclosed with a massive earth rampart, nowadays obstructs almost completely the ancient tumulus, making it difficult to fully distinguish its true former commanding position and outline. Taking into consideration the results of the most recent excavations in the area of the tomb's entrance, it seems very probable that the military's earthern structure was partially constructed using soil from the embankment of the Documaci mound, sometime in the early 1970s.

Movila Documaci appears named and described as an 8-m high mound on the Romanian military topographic map (scale 1/20000), produced between 1955-1959, before the building of Mangalia's military facilities (Figure 27/a). The name has a Turkish origin and means 'weaver'. It hints at the recent Ottoman past of Dobruja and its multi-ethnic population. The map referred to the entire ridge on which the tumulus occupies a central position, as *Documaci Hill*. This denotes that the name of the hill could have been transferred to the mound, very probably because it was the highest point in the relief. A feature labelled as *Documaci Valley* also appears on the same map, 850 m east of the mound. The Romanian military topographic survey, edited during the 1970s (scale 1/25000), mentions only the *Documaci Valley* (Figure 27/b). It includes the mound's name, its height (+8 m), but as for the shape, this was depicted as being bisected by a field road drawn along the outline of the polygonal dyke of today, i.e. to the east of the mound, in contrast with the field road which nowadays passes to the west.

The 1/50000 Soviet maps, dated 1976, identified the *Documaci Mound* by name, but registered only a 6 m height (Figure 27/c). This value is in fact much closer to what we can measure on the terrain today. We interpret this difference in reported mound heights between the Romanian and Soviet versions of the maps – released practically in the same period – as a clue that after the earliest topographic recording, made during the mid 1950s, when the mound could have indeed measured 8

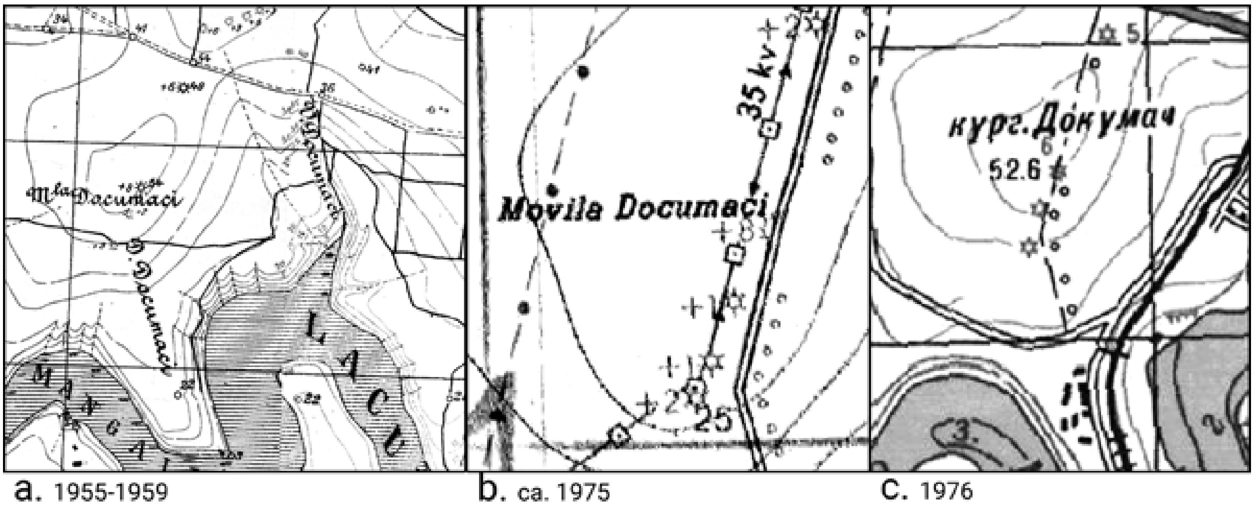


Figure 27. The Documaci mound/*Movila* on older maps.

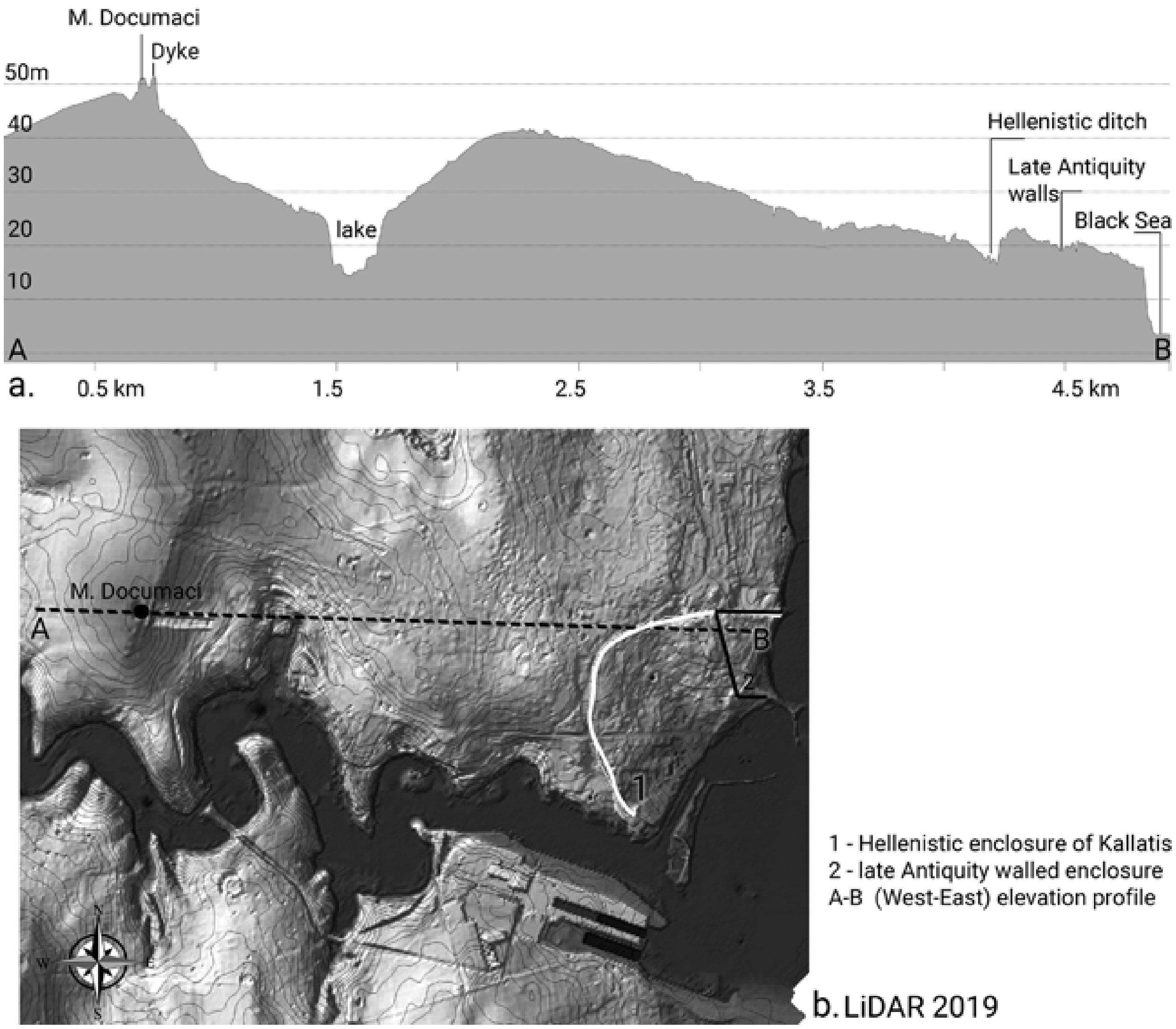


Figure 28. General altimetric profile calculated from LIDAR data.

m, the embankment was affected by the construction of the military dyke (or by other interventions), not only in shape, but also in height. The Romanian version included the modified shape, but very possibly just copied the height from the older maps.

The studied tumulus occupies a high position (45 m.a.s.l. at its base) with what was once an overall view of the surrounding landscape, including the Black Sea (Figures 28; 83). It is in fact the highest located point above the city, on a corresponding east-west axis, while the terrain continues for an additional 5 m. The dominant position is provided by a hilly ridge orientated here in a north-south direction, but which continues towards the north-east, surrounding, thus the entire area occupied by the ancient urban nucleus, rather like the upper story of a theatre's *cavea*. This ridge, rising 3 km from the Hellenistic fortifications, marked the natural limit of the urban *necropoleis* and the allotted plots (Figure 22). The terrain drops immediately both to the east (towards the city and sea) and west of the Documaci mound. West of this ridge there are no neighbouring tumuli. The closest located ones can be observed only after distance of 2 km. The Documaci mound was located at the periphery of the ancient city's immediate *chora*, but, nevertheless, in a significant position in terms of visibility. The ridge on which it was built is the furthest visible line from the ancient city on its western horizon. It belongs to the city's direct area of symbolic reference. At the same time, a connection with a possible secondary harbour for Callatis, located nearby at Lake Mangalia, a potential ancient estuary, should also be taken into consideration. A current military harbour is located in the area where Documaci Valley reaches Mangalia Lake.

The Documaci mound was not an isolated, single tumulus, but part of a small group of mound graves arranged along the hilly ridge which functioned as the

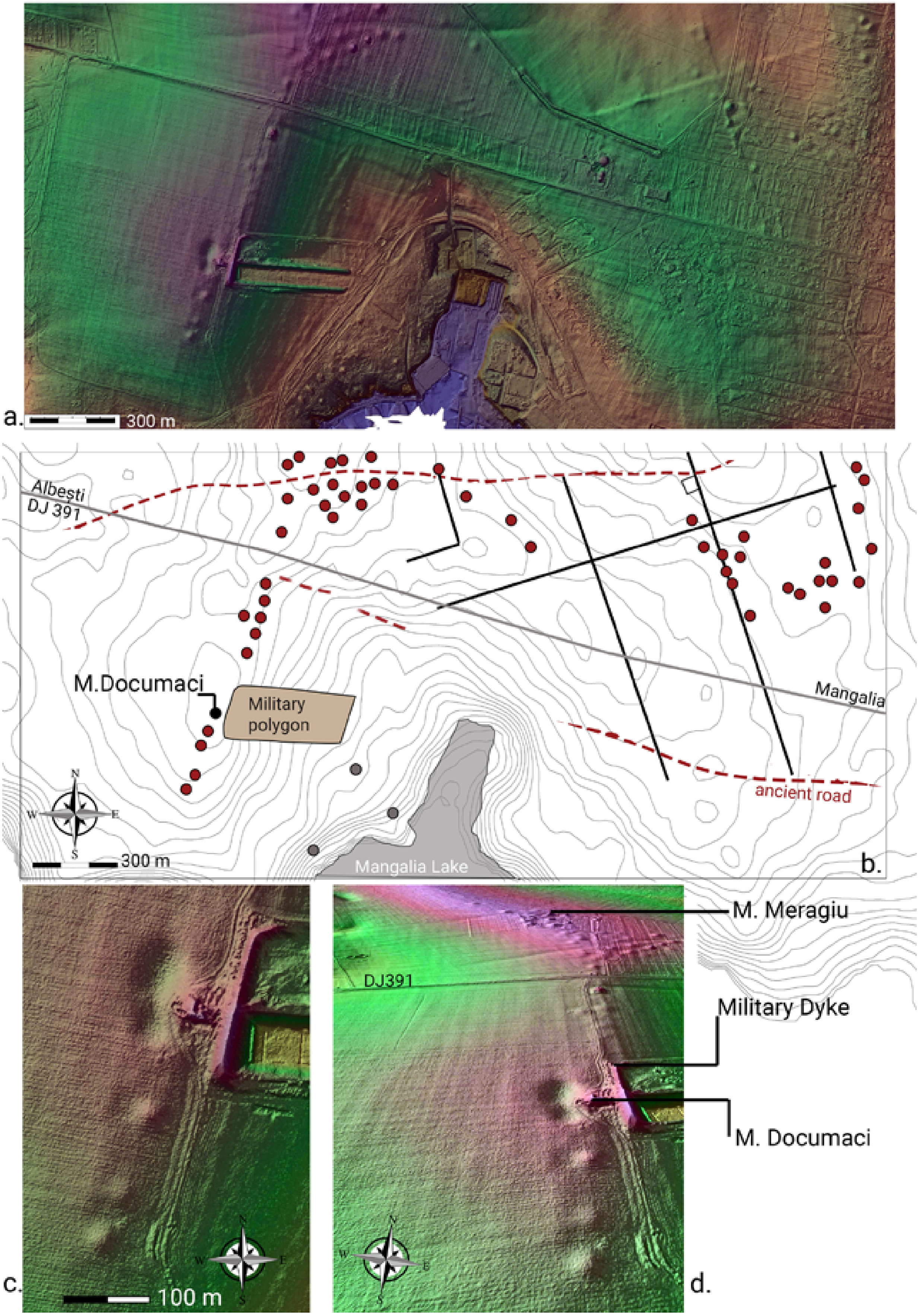


Figure 29. Surrounding funerary area: a, c, d) LiDAR data; b) interpretation of (a): mounds, ancient plot delimitations, ancient roads.

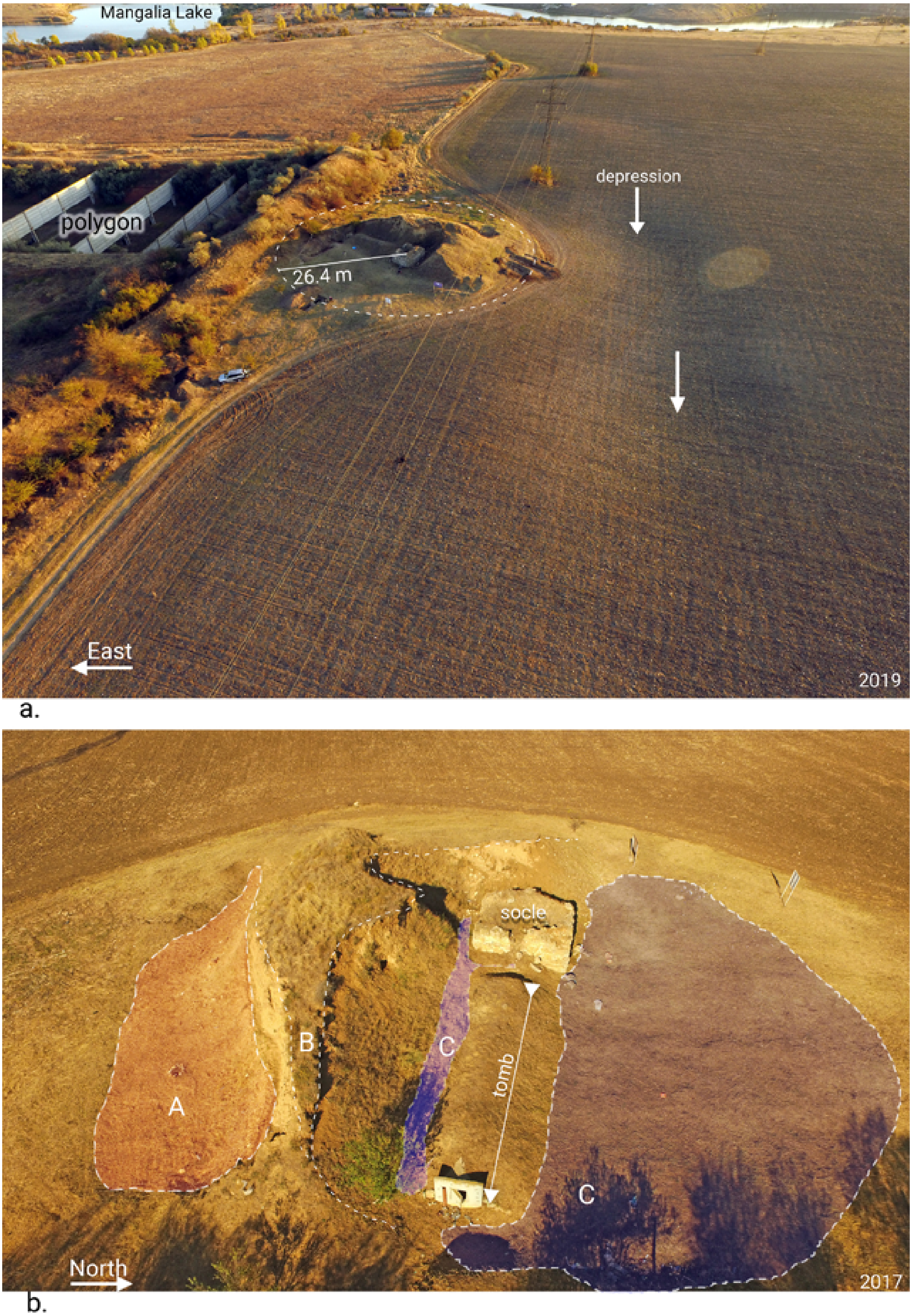


Figure 30. Aerial images of the Documaci mound. A) destroyed by machines in 1993; B) preserved in elevation; C) excavated with machines and then archaeologically tested between 1993-1995.

western margin of the funerary area of Callatis (Figure 29). This ridge was perpendicularly crossed by the ancient road leading to a Hellenistic fort marking the border of the Callatian *chora* in this direction (nowadays the village of Albești). South of this road there were identified ten mounds in addition to Documaci – spread over approximately 850 m. The highest of this group stands directly south of the main road, 460 m north of Documaci. It measures 4.3 m in height and has a diameter of 44.5 m. A large quantity of boulders was collected at some point at its southern margin and a looting pit was dug in its summit. A preliminary ERT study of this mound did not detect evidence traces of a stone *krepis* or funerary construction inside. Between it and the Documaci mound at least six more circular terrain anomalies follow the same alignment, organized in two rows. They measure now only 30-60 cm height and diameters between 45-55 m. They are spaced at distances ranging from 22 to only 5 m.

The land was heavily altered by ploughing and their embankments not only levelled but also probably scattered. Remains of limestone boulders and Late Roman pottery are dispersed above their flattened embankments, especially on the eastern side of the field road. This period of intense reoccupation of the mound cemetery for habitation, and the very probable lootings and dismantling activities of the 5th-6th c. BC, were likewise clearly attested in the trenches we excavated in the northern and eastern sectors of the mound (Figures 36/e; 62; 143). These activities took place at some time after the burial practices ceased in the ancestral family tumuli of the Callatis community. South of Documaci there are another five flat mounds, with diameters of *c.* 45 m and heights from 1.5 m - 60 cm, observable on a north-south alignment of approximately 260 m in length, and are spaced 40-70 m intervals.

On the north side of the road to Albești a larger group of mounds (at least 35) was well evidenced by remote sensing studies, *c.* 1 km north of Documaci. They occupy the highest sector (50 m above the Black Sea) on the same ridge on which Documaci stands, with the highest mound (*Movila Meragiu*) currently rising 8 m above the surrounding field. Some of these mounds were levelled by agricultural activities to just several tens of centimetres, while others, including *Meragiu*, were included inside the confines of the military base, and thus currently inaccessible for research. The comparative study of the way these neighbouring mounds were spatially organized may be significant for our understanding of how the Documaci mound fitted with the rest of the funerary areas of Callatis – a relationship which may, after all, indirectly reflect an identity statement encapsulated within the funerary discourse in terms of group membership versus individuality. For example, this consistent group of mounds located to the north of Documaci, around *Meragiu*, and practically on the same peripheral ridge, is organized in what can be recognized as an alignment derived from the cadastre system of the *chora*. The crowded space around *Meragiu* seems to represent a family (or a group of families) burial grounds, set distinct inside the city's properties.

The tumuli found near Documaci are all, but for one, small, and have as reference the road, not the cadastre. *Movila Documaci* did not stand inside a delimited plot. Those who built it placed it at the cemeterial area periphery, but nevertheless still in a significant position in terms of visibility. The ridge on which it was built is the furthest visible line from the ancient city on its western horizon, very probably a landmark for navigators. It belongs to the city's direct area of symbolic reference. The mound was meant to be seen from the city as a specific and individual feature. It was also seen as a first representative monument by those approaching the city by land or water from the west.

General geographical features and background

Valentina Cetean

Geomorphology: The area covering Mangalia-Limanu-Albești geo-morphologically belongs to the area of the south-Dobruja plateau, of the Negru Vodă Plateau respectively (Figure 31) Its characteristics are typically of a tabular relief of the pre-alpine carved structure (the Dobruja Orogen): heights of 80-150 m, slightly fragmented in the shape of bridges or wide ridges, with karst plateau relief (Badea *et al.* 1976). The main karst forms that give a wavy look are the dolines (sinkholes) and caves. The large number and their disposal determine the surface water flow, not to the Danube or to the sea, but in depth, through the karst crack networks of the Sarmatian limestone.

Hydrology: The main hydrogeological elements characterizing the surrounding area of the Documaci mound are represented by surface water bodies (stagnant or flowing) and groundwater.

Lake Mangalia is less than 1 km south of the researched area and drains all the temporary watercourses that form around the area. This is a lagoon formed in the lower part of the Albești stream, before its flow into the Black Sea, from which it was previously isolated. Later on, Lake Mangalia was transformed into a marine bay, by collapsing the strap of land that separated it from the sea, as well as dam improvements to stop salt

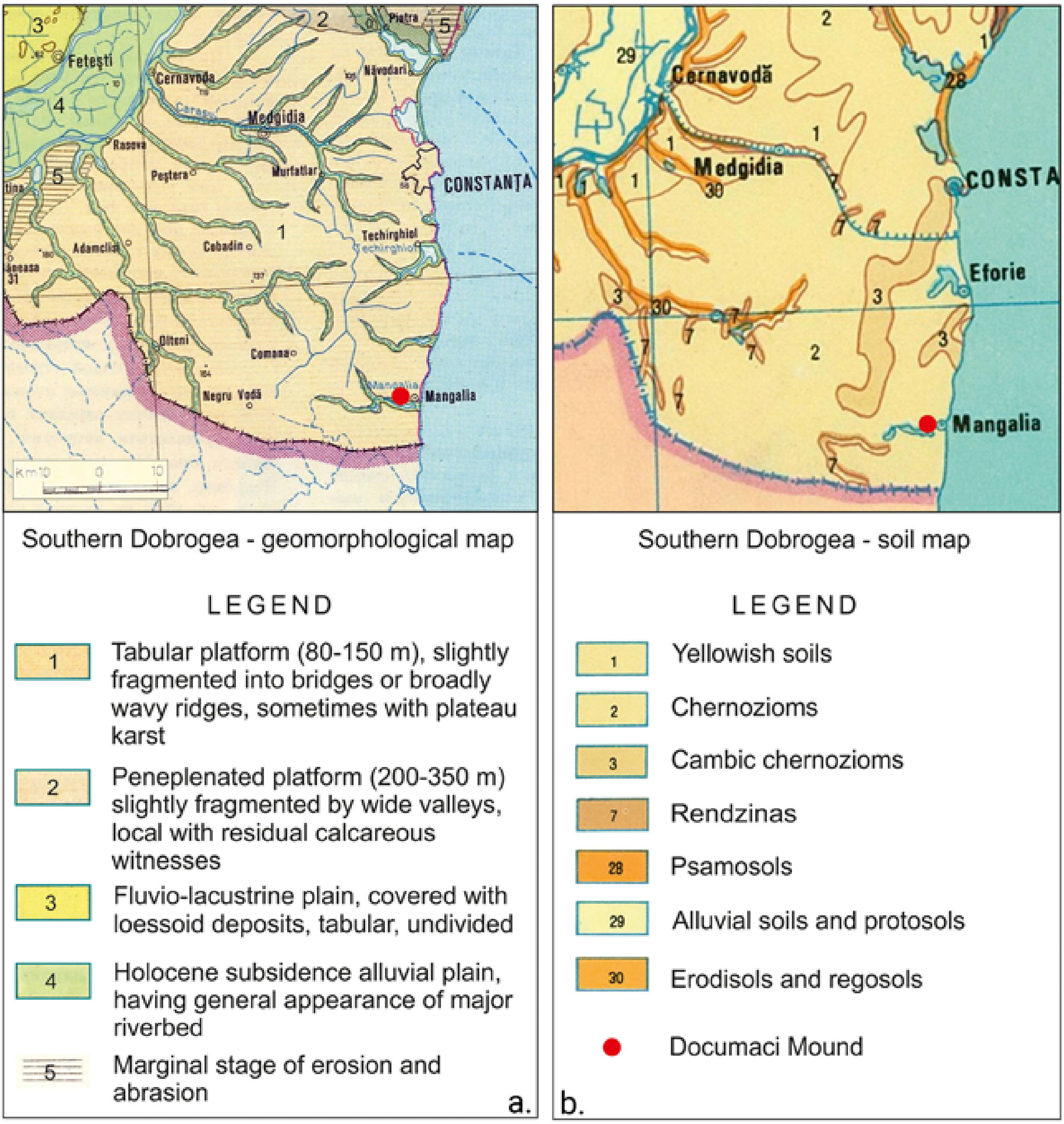


Figure 31. General maps of Southern Dobruja; a) geomorphological map, scale 1:1,000,000, (Badea *et al.* 1976); b) soil map, scale 1:2,400,000 (Florea *et al.* 1978).

water from reaching the end of the lake.[1] With a total length of 25 km and hydrographic basin of 326 km,[2] the Albești stream is the most important watercourse in this area, having the Luminița stream as its main tributary on its right side. In the past century, the heavy meandering stream was regularized and subjected to hydro-technical works, so that along its way there are two other lakes besides Lake Mangalia: Lake Hagieni, upstream, and Lake Limanu, located in the area halfway along the Albești stream. In the Albești valley area there was some drainage of the groundwater from the Sarmatian period.

There are two bodies of water disposed in the underground region of the Documaci mound. The surface water of Quaternary age is now at a depth of 20-35 m, which a few decades ago supplied the wells of this area, now considerably reduced due to water movement into the depths. The main underground water aquifer is of Sarmatian age, referred to as the groundwater body

[1] See www.rowater.ro. accessed date 5th March 2020.

RODL04 Cobadin-Mangalia (Zamfirescu *et al.* 2006). It has a cross boarder nature and is a soda-magnesium-calcium bicarbonate drinking water source of great quality for the whole southern Dobruja area.

Soil characteristics: Directly influenced by the climate and the hydrology of the area, the soils which emerged on the carbonate and the loessoid sedimentary deposits were the chernozems (Figure 31/b) (Florea, Parichi 1978).

Climate and vegetation: From a climatic point of view, the southern part of Dobruja is defined by a continental climate, with important maritime influences and with large variations of air temperature that occur often and annually. Although it is located near the Black Sea, the area defining southern Dobruja is the most arid part of Romania. The specialized Romanian classification associates the area of Mangalia to zone I, having minimum temperatures of -12º C, with a temperate continental climate zone with a Pontic influence. According to the Köpen climate classification (Peel *et al.* 2007), southern Dobruja has a warm, oceanic climate/humid subtropical climate (Cfa).

Elements of regional geology and hydro-geology

Valentina Cetean

Regional geology and area delimitation: The Mangalia-Negru Vodă area belongs, geologically, to the Southern Dobruja Platform. It is bordered on the west by the Danube (aligned north-south on the Galați-Ostrov direction), on the north by the deep ridge formed between Palazu Mare and Dunărea village, and to the east it goes under the waters of the Black Sea.

The regional geomorphology is without major differences, resembling a suspended plateau between the lower areas of the Danube and the Black Sea. This aspect is a direct consequence of the geological evolution, which led, from a structural point of view, to the current Precambrian crystalline foundation in its central part (which goes down in steps to the south), as well as the Jurassic and Cretaceous aspects of the sedimentary cover.

Although in some geological time periods a common evolution of the South-Dobruja Platform, with some bordering structural units, such as the Wallachian Platform, several lithofacial differences were displayed and some other variations regarding the geodynamic processes, indicating that the two platforms are in fact distinct structural units.

The oldest configuration of the sedimentary cover noticed in researches from the Mangalia area are of Silurian age (443-419 million years), represented by quartzite sandstone, upon which sit black clays and calcareous shale. Over successive stages of marine regressions and transgressions, sedimentary deposits of clay, sandstones and carbonate (Rădan *et al.* 2013) were formed, some still identifiable along the long valleys.

The most relevant geological period used to describe in a multidisciplinary way the archaeological site at the Documaci mound is the Sarmatian period (16-7.2 million years) (Cohen *et al.* 2020). It is emphasized that during this time the advancement of the waters from the Vama, followed by a withdrawal which carried away the masses of various rocks. This occurred successively and continuously over the entire South-Dobruja platform, forming a considerable plate of marls, clays, sands, bentonites, diatoms, oolithic and lumashellic limestones (Mutihac 1990), known as the Cotu Văii Formation, named after the village. The last two categories of rocks comprised the main object of study associated with the funerary complex from the Callatian area, as they most suited the conditions that represented the raw material of the stone blocks and fragments used in the construction of the funerary assemble, the pedestal of the monument, and also the peripheral and sustaining walls of the mound.

Regarding the elements of hydrogeology, the attributes of the entire area of the South-Dobruja Platform should be stressed: the sweep of the Danube, whose course overlaps it, as well as the Black Sea, and which drains all the surface water flows through the main valleys. In the area of the Documaci mound, Lake Mangalia, now a marine bay, is the one that makes the connection with the Black Sea.

The calcarenite, micritic limestone, oolithic and Sarmatian (Kersonian) limestone deposits that flow near (1-3 km) the area of the funerary complex (Figure 32) are important not only as building materials, but they are also found throughout southern Dobruja (Baltres *et al.* 2020) and hold the most important body of underground water (the aquifer RODL04 Cobadin-Mangalia). The limestones form a plate with a thickness of 10-150 m, slightly inclined towards east, and the limestone pack from the Senonian ridges found at the base forms the bedrock of the aquifer. The carbonate deposits hold levels of Pleistocene loess of variable thickness (0-20 m), with a high vertical permeability, with local impermeable layers of clay that lead to local water accumulation.

At Limanu, the aquifer ROL04 Cobadin-Mangalia springs to surface and feeds the lake, but in the case of the Documaci mound this level was already covered with at least 3 to 5 m of loess, as was recorded in the archaeological excavations made in the area of the mound.

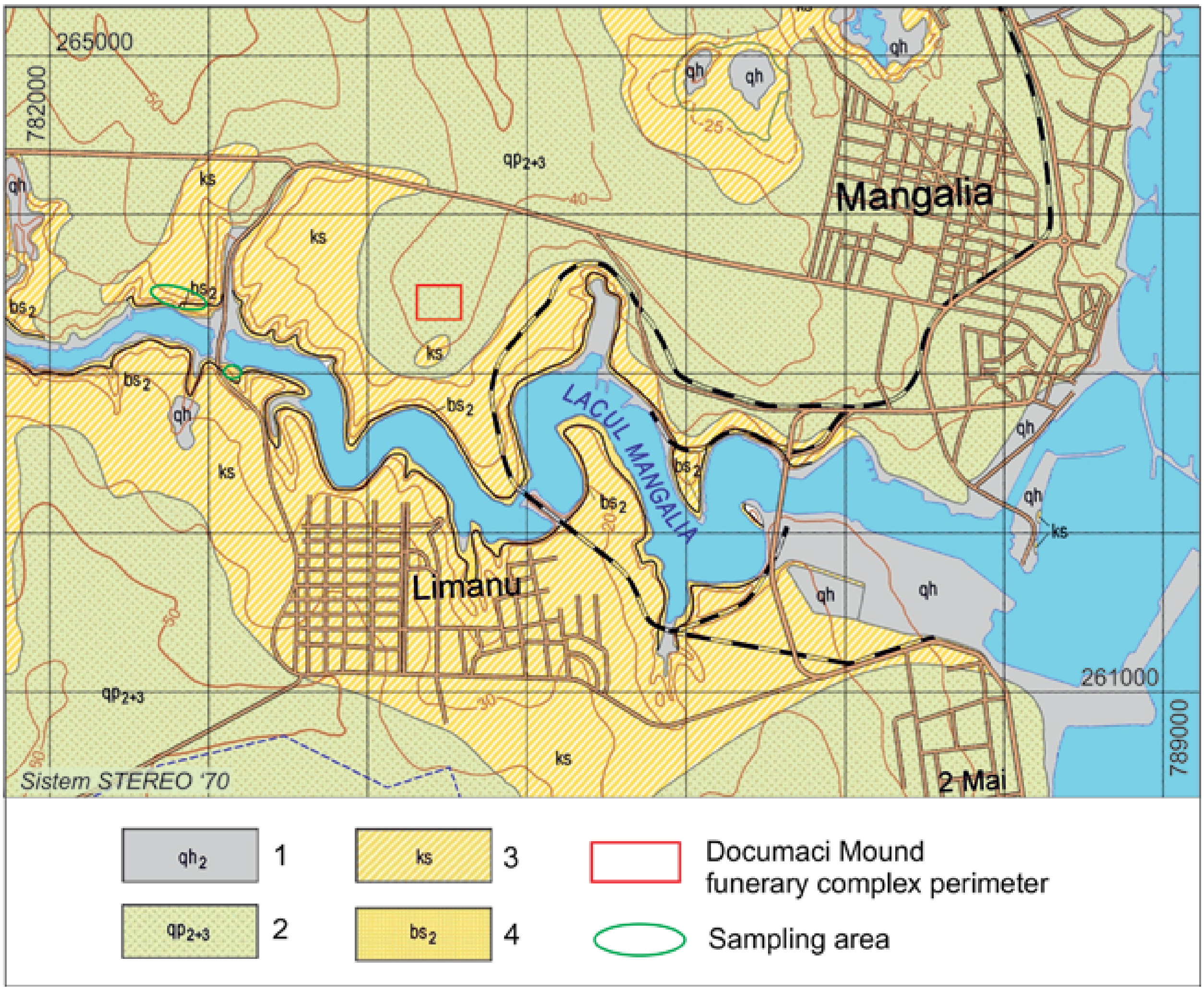


Figure 32. Details of the geological map of Romania, scale 1:50000, sheet 192C, Mangalia, K-35-10-C (unpublished; after Baltres *et al.* 2020): 1) Holocen (Eluvia, colluvia, swamp sediments, beach sands and gravels, technogenic deposits); 2) Middle and Upper Pleistocene (Loesses with fossil soils intercalations); Cotu Vaii Formation: 3) Kersonian (Fine limestones, sometimes lumachellic, with small-sized mactra (Mactra caspica), karstified and pigmented with red iron hydroxides – Upper Limestones); 4) Upper Bessarabian (friable limestones and lumachellic limestones with small cardia; white micritic limestones with rhizolites; fragile calcarenites with Nubecularia and small gastropods).

Although it does not have an actual hydrogeological significance, the Quaternary surface water, along with the seasonal precipitation level, is what determined the humidity variations of the loess deposits. These processes determined the physical deterioration present inside the tomb. Traces of clay material that once breached the walls is clearly visible as it leaked onto the surface, causing local mortar separation or swelling, affecting the structural integrity of limestone blocks (by sanding, dissolving or laying carbonate material, as well as limonitic or clay minerals carried and deposited more easily in an aqueous environment), or flooding through accumulation in the lower part of the construction

The presence of water in the clay-loessoid levels that constituted the mound also influenced the amount of clay and limonitic material accumulated on the surface and in the gaps of the pedestal, placed west of the tomb. However, the fact that these natural processes took place in the massif from which the stone was extracted, does not allow a univocal separation between the alteration and deterioration of the blocks that happened after the construction and how many were solely from the source area.

Karstic processes in the area: South Dobruja is a predominantly calcareous area, although limestones do not always appear in outcrops; nevertheless karstic processes are common. The most representative of them are gorges, caves and sinkholes, and also the valleys with seasonal flows or swamps in the sinkholes. The sinkholes in this region are called 'obane'. Although carbonate deposits are often covered by loess in the

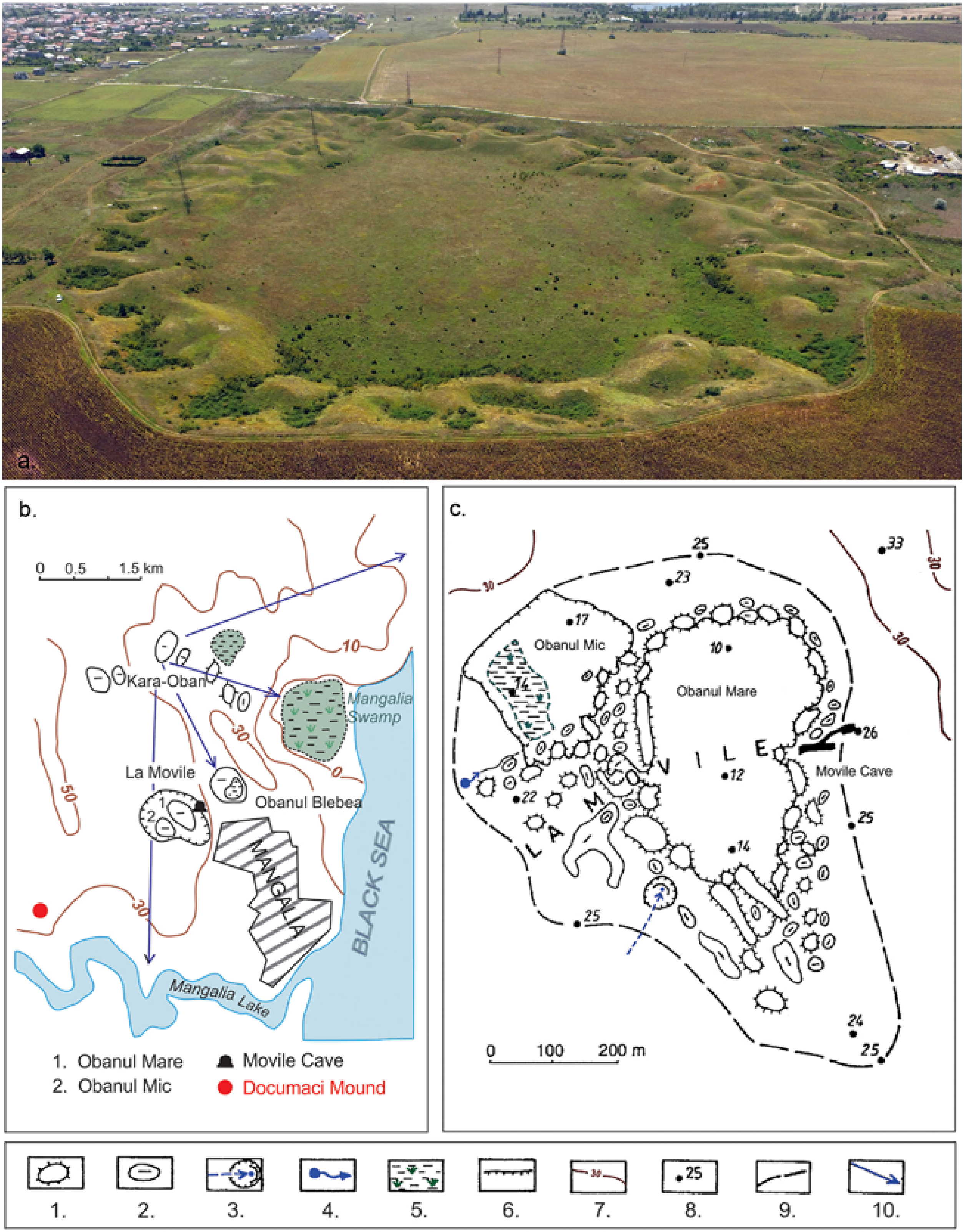


Figure 33. Development of karst processes west of Mangalia: a) aerial view of *Obane* area and *Movile* Cave entrance (photo D. Stefan); b) *Obane*, *Movile* Cave and Documaci mound perimeter location in relation to the underground flow direction; c) karstic aspect of *Obane* area (processed by V. Cetean after Niță 2017). Legend: 1) *Movile* (conical limestone hillock); 2) sinkhole; 3) swallet-sinkhole; 4) perennial spring; 5) swamp; 6) cliff; 7) contour; 8) elevation; 9) limit of the 'La Movile' ouvala; 10) proved underground drainage.

areas between valleys, the limestones on which they rest are the ones defining the morphology of the region and the characteristics of surface or deep-water bodies.

The area adjacent to the Documaci tumulus includes many of these exo- and endo-karstic phenomena. Less than 2 km to the west is the Limanu cave, as well as gorges of smaller size. Another special area from a morphological point of view, resulting from karstic processes, is located 2 km northeast of the Documaci site and known as *Obane Movile*, which would certainly have been known in the historical period of Callatis.

The main two sinkholes located west of Mangalia are *Obanul Mare* and *Obanul Mic* (Figure 33). With them, the collapse of some limestone deposits, due to underground erosions, led to the formation of a wavy relief, which has long provoked contradictory interpretations regarding their nature, i.e. from natural processes or of an anthropic character (Pădureanu 2014). The integrative examination of the general images, documented references and public recordings related to the mining activities in the perimeter indicate the underground karstic processes as the main factor for the local geomorphology. Additionally, limestone extraction activities from 'positive' elements of relief around the *Obane* sinkholes were carried out for local construction purposes (for stone structures and/or lime). As a result, many excavated small areas (the mining points), even if quantitatively unimportant, have overlapped the karstic relief and completed the current appearance of the area.

But even more special are the other two geomanifestations associated with this area. In 1996, following a drilling program for hydrogeological prospecting, a unique speleological habitat was discovered immediately east of *Obanul Mare*. The geological evolution and the special conditions of total isolation from the outside for almost 5.5 million years within the Movile cave, facilitated by hydrogen sulphide presence (H_2S), dissolved in thermal water from deep karst deposits, led to the formation of spectacular, specific fauna living in a sulphur-poisoned atmosphere (Cetean 2019).

And although this cave was not known in modern times until end of last century, it is very likely that the inhabitants of Callatis knew and used the sulphur thermal springs (of the same origin as the water from the Movile cave), located just north of Mangalia, in the vicinity of the Black Sea (Figure 31/a). In the swampy area there is specific vegetation (Niță 2017) and the waters still have beneficial properties for health.

Chapter 5
The Enclosure Wall (*krepis*)

It might have seemed in a way more logical to initiate the description of the Documaci mound with a chapter about the morphology of the embankment and not to introduce directly a report on walls, pavements and altars, as we did; but because the shape and structure of the mound were so decisively defined by the existence of the *krepis* wall in what concerns both the construction design, in which the composing parts were definitely linked to one another, and the subsequent secondary depositional evolution of its strata, we opted to detail foremost the enclosure wall (Z1) and, thus, to gain further an overall reference framework for all the other elements of the funerary ensemble.

General layout and dimensions. 3D electrical resistivity tomography interpretation and results

Maria-Magdalena Ștefan and Dan Ștefan

The main observable structure on the geophysical survey (Figures 9; 34/a-b) was a resistive anomaly with an almost circular layout, marking discontinuously the base of the mound. We tested this geophysical anomaly with trial trenches in four sectors aiming to solve various questions raised by the ERT data. The details of these excavations will be given in the subsequent chapter sections.

As the excavations revealed, the ERT identified not just the enclosure wall (further labelled Z1) but included in the layout and shape of this main resistive anomaly the dismantled stones fallen from it towards the exterior of the mound (Figure 36). This situation occurred in all trenches. Consequently, it was noted that the width of the enclosure wall, when judged strictly on ERT data, had the potential to appear larger, from slightly larger to double. The excavations showed also that the interior margin of the wall had nevertheless survived almost intact (Figures 36/b; 38/d-e; 40/FG), appearing clearly delineated in the ERT data, too. All the debris from the enclosure wall, in the excavated surfaces, with one exception,[1] had been found as fallen exclusively outside the embankment, indicating that the wall's exterior face was initial visible, exposed, while the back was adjoined to the embankment. The inner side of the wall, even if not affected by collapse, was found distorted by the weight forces of the huge mass of soil heaped behind. Thus, the wall appeared as inclined towards the exterior, especially in its upper part (Figures 36/e; 37). A displacement of 10 to 40 cm can be estimated for some sectors, when taking into consideration the interior outline of the enclosure. In trenches S2 and S4 the enclosure wall remained in place only in the sector where it was doubled on the exterior by the large rectangular base (Z3), which acted indirectly as a kind of buttress for the enclosure wall, increasing its resistance against the pressing force of the embankment in that area.

As the shape, perimeter and diameter(s) of the mound and its enclosure wall may be established in the current stage of research only by combining the excavations and geophysical results, these details regarding how the wall had survived or not in its initial outline, and to what degree the geophysical data reflect the true dimensions of the walls, matter especially in the case where one attempts a further a determination of the measuring unit module.

Some details regarding the building technique, elevation level, shape, chronology and ruination of the mound enclosure wall were clarified specifically for the researched sectors. A part of these actual data was extended for the entire structure by taking into consideration the results of the geophysical survey verified with excavation; other details, however, await further investigation, as more sectors of this wall are researched (significant data is lacking for example for the southern sector, which was the heaviest affected by modern destructions and which is also the only one less aligned to the general circular shape of the mound (Figure 34/c). Due to the monument's complexity, the period of just two and a half years of our research program was evidently not enough for a complete exploration. These are, therefore, partial results, with a number of questions left open.

By taking into consideration the interior margin of the enclosure wall visible on the ERT, a medium width of the wall of 87 cm (as documented in trenches S2, S3, S4 and S5), and the outline of the wall arches already uncovered in excavation, we may notice that the shape described by this structure can be best approximated with an ellipse measuring 27.4 m NE-SW x 26.4 m E-W, with a 169 m perimeter, respectively. In this configuration the ellipse centre appears located 1.24 m to the south-east

[1] In a single situation documented in S11, a small heap of stones was found in the interior corner where the enclosure wall met the Z9 wall (the northern margin of the inner courtyard); we consider however that these stones were laid here intentionally, either as left-over material from the construction or perhaps in order to reinforce the wall corner (Figure 40).

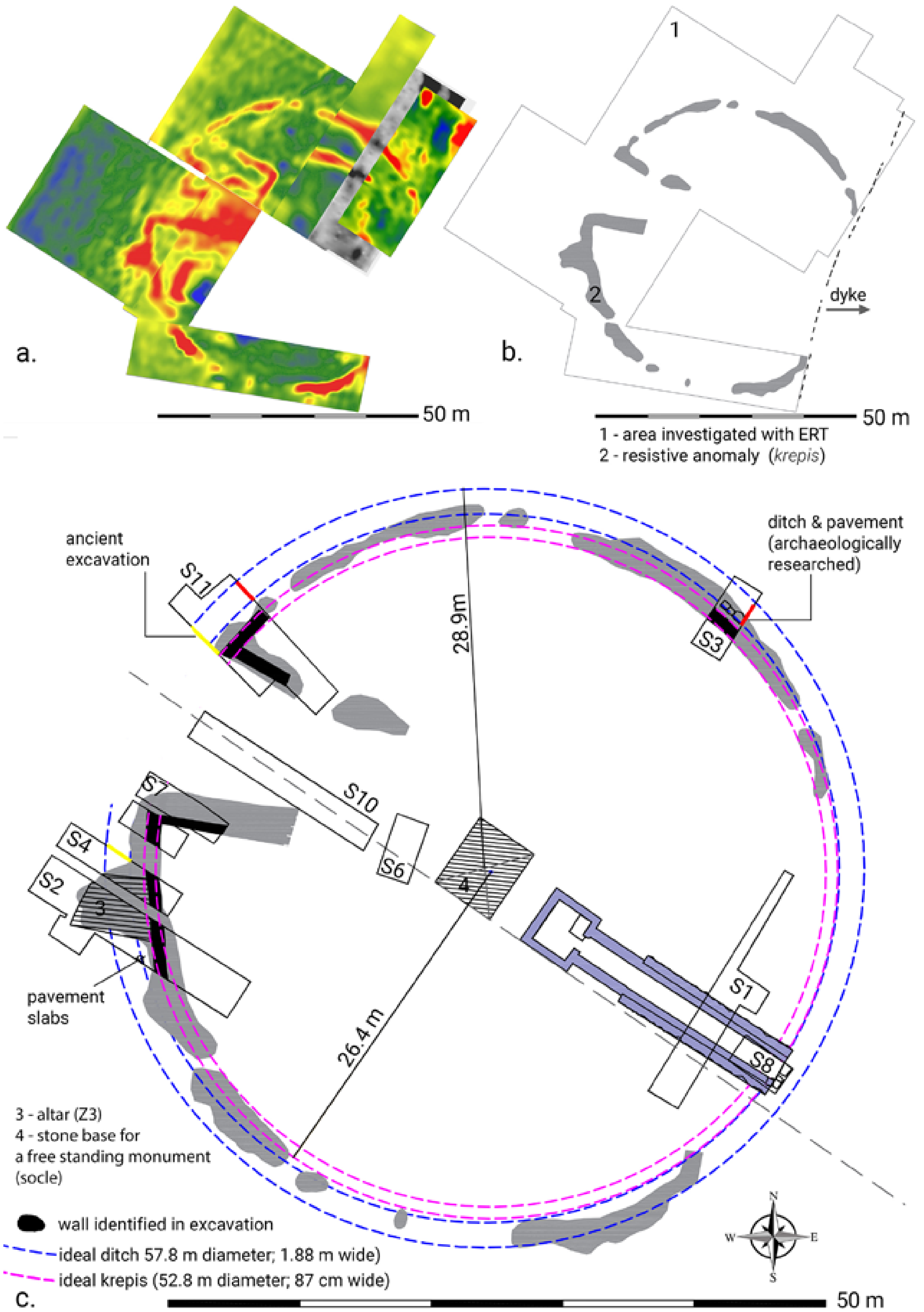


Figure 34. Plan of the funerary ensemble components and trenches 2017-2019; mapping of the *krepis* ideal circle; a) ERT results (after D. Ștefan); b) interpretation of ERT for the *krepis*.

a.

b.

Figure 35. Aerial images of the western sector of the Documaci mound, with altar and walled inner courtyard for ritual offerings (recorded by D. Ștefan); a) a Photoshopped collage of digs in 2018 and (b) 2019.

of the socle's centre, on an axis perfectly perpendicular to the middle of the funerary chamber tomb's western wall – the one opposite the entrance.

However, a circle with a diameter of 52.8-52.9 m and a centre at just 60 cm east of the socle's centre estimates quite well the ideal shape of the enclosure (on the exterior), linking perfectly the excavated sectors, missing only the south-eastern sector as seen on the ERT, which appears displaced by 1.4-2 m towards the south (Figure 34). The ellipse shape could be caused by the aligning of the mound axis with the main relief ridge. It is, at the same time, the most affected sector of the mound by prior modern, mechanized work, the same one which remained still unexplored by newer excavation. An exterior ditch, with an average of 1.8 m width and variable depth in relation with the *krepis*, was found encircling the mound; it was paved with slabs which were laid at the same absolute level, either in the north or western areas. A circle with the centre in the socle's centre and a radius of 28.9 m approximates well the researched ditch fragments. The diameter of the entire ideal circular design, including this ditch, would be, thus, 57.8 m and the perimeter 181.58 m. A supplementary belt of irregular shaped stones was found in S11, outside the ditch (Figure 47/a-b), suggesting that the entire arrangement could have measured as much as 63 m in diameter.

The foundation ditch for the ancient entrance in the gable roofed *dromos*, partially dismantled even since the Late Roman period, was identified in the most recent excavations (S8) (Figure 146). In total, the tomb's corridor measured about 17.8 m in length. At this dimension, the *dromos* could have reached the margin of the enclosure wall calculated on the 52.8 m diameter circle. This value corresponds practically with 159 Hellenistic feet of 0.332 m (Broneer 1941: 23, 24, 28; endnote 22).

Excavating the *krepis*

Valeriu Sîrbu, Maria-Magdalena Ștefan, Dan Ștefan, Alexandru Halbac, Florentina Marțiș

Building technique particularities

The *krepis* stone wall was assembled, without foundations, directly on top of an initial levelling made with dark brown (clayish type), well beaten soil. This layer was extremely clean and compact, without archaeological or stone pigments. In only three cases were very small, isolated shards found in it (two finds of Thracian hand-made pottery and one find of a shard of a Hellenistic amphora). Its upper limit was straight, intentionally arranged, while the lower was irregular and blended smoothly in the soils beneath. The fact that this type of soil was found exclusively in association with built structures of the mound made us conclude that it was a brought in material. A 2-3 cm layer of yellow clay mixed with limestone chips was observed underneath the base of the *krepis* wall in all the excavated sectors, including towards the interior of the mound, for about 1 m (S5). Because the stones used for the first laid course were not flat, the absolute elevation measurements for the wall's base varied from 3 to 6 cm along a length of 2 m. A thin layer of centimetric stone debris, coming from the *in situ* stone working, marked the building level for the *krepis*, extending both on the exterior and interior of the mound for 1 to 2 m. This is an indication for the building of the enclosure wall as having been undertaken prior to the heaping of the mound.

Irregular shaped and sized limestone boulders were used as building material (Figures 36- 41). They were only slightly worked to fit to the wall's faces, having the gaps filled with smaller stone debris. Because the wall was firmly attached to the light brown or yellow loess embankment layer heaped behind (and very probably well beaten once put in place), it is hard to say if soil was used additionally for filling the masonry gaps, as the boulders were not neatly fitted (most probably), or if the loess visible today between the stones had just infiltrated from behind. For the wall faces the aligned boulders measured 30 to 50 cm in length and about 20 cm in height. Occasionally, slender slabs were used as well.

The way the building material was selected and fitted together reveals that the wall was assembled by several different teams working simultaneously. For example, in S2 the enclosure wall was beautifully assembled of thin slabs measuring just 5 to 10 cm thick each (Figure 38/d-e). The wall aspect in this sector is of meticulous treatment in comparison with the wall in S3, the masonry of which appears obviously rougher (Figure 36). However, as there are no stratigraphic arguments for different dating, nor actual differences in the building materials, we read these working style variations just as indicatives of different hands. We find no clues that any additional coating of the wall on the exterior (with slabs or plaster, for example) existed.

The blocks and slabs were arranged in courses, generally block over block when they matched size. The researched sections revealed the wall as preserved to four to nine courses of various heights. The preserved height of the wall varied, from 1.20 m in S3 and 1 m in S2, to 40 cm in S11 and 65 cm in S5. The width of the wall was relatively constant, 85 cm to 88 cm. Therefore, we suppose that the fallen boulders, some of which were found right at the base of the enclosure wall, on the exterior, must had belonged to its elevation, not width. Judging from the quantity of fallen boulders and differences in preserved height we estimate that the enclosure wall had an elevation not higher than 1.5 m, with some segments, those bordering the interruption zone in the north-west (see further the description for the *Open space/courtyard*), measuring even less, as we suppose they were built in a crescendo, rising once the lateral embankment, bordering the walled *courtyard*, raised, too.

In S3 the researched segment of Z1 described an arched outline that was noticeably leaning towards the exterior – almost 11° from the vertical (Figure 36). After the wall was assembled to its full height, the ancient builders filled its back with a thick and compact rampart of yellow-reddish, clean and well beaten loess. The absence of any layer of stone cutting debris near the interior wall face along its entire preserved height shows that the loess rampart was added only after the wall was completely raised. This detail is also consistent with what was observed in other trenches.

Traces of the yellow-reddish loess rampart, backing the enclosure wall, were found as well in S4, while in S11, the layer measured only 25-30 cm in height, indicating that the entire area, including the upper part of the enclosure wall, was at some point completely destroyed/levelled. The date for this intervention seems to be quite recent, as the materials found indicate (anytime during the 18th-20th centuries).

As the profile of S3 revealed, a major intervention affected the northern part of the mound as well, causing a destruction of the embankment at a moment when the enclosure wall had already collapsed. A statement from Georgescu's 1996 report places a coin of the 3rd c. AD in trench SIII/1995, the same one being partially reopened and extended through the novel S3/2017-2018 (Figure 62/a-b). By reopening a segment of SIII/1995, it became possible to attempt an interpretation of the poor resolution image preserved of the stratigraphic documentation from the 1990s.

Exterior pavement around the krepis wall

In the northern sector (S3), a pavement of large soft limestone slabs with smoothed surfaces (60 to 90 cm long each, 10 cm high), selected to resemble as much as possible rectangular shapes, was observed surrounding the enclosure wall on its exterior (Figure 36). The pavement covered the entire width of trench S3 (2.5 m), forming a kind of belt (70 cm wide) 45 cm away from the wall exterior, but 30 cm lower than the wall's building level. They were probably laid in a previously excavated space, of which only the northern margin (cut) is clear, suggesting that this shallow ditch, with flat bottom and slightly inward oblique walls, measured 1.80 m in width and 40 cm in depth. In the vicinity of the wall, there is no clear-cut line in relation to the dark-brown soil on top of which the enclosure wall was built; it almost blends with this soil representing the brought-in layer for the initial levelling. We interpret this situation as an indication that not just a ditch was excavated, but a larger area underneath the future mound was also scraped and the vegetal layer replaced with a well beaten fundament, with the exception of a 1.8 m wide belt around it which remained lowered. The vegetal layer was replaced to its initial height (in S3), as the wall base is at the same level as the ditch mouth. This would explain the differences in absolute elevation values for the enclosure wall bases as recorded in different excavation sectors (Table 9). The levelling was not made to obtain a zero-flat terrain, but a solid foundation for the embankment. A compact layer of limestone debris originating from *in situ* stone cutting (of the pavement slabs probably, and of the *krepis* wall) filled the bottom of this ditch, being observable underneath the slabs and in their continuation towards the north (exterior), marking the level from where the scraping started – the initial ancient walking level in the cemetery.

The slabs cover now only a part of the exterior depression, but we suppose that initially they occupied the entire excavated space outside the wall, their current partial absence being caused by an ancient dismantling before the enclosure wall (Z1) collapsed. When Z1 fell (in the sector documented in S3) it was at first a sudden event with an entire course of blocks of its top falling as a group at the foot of the wall, on the mound's exterior, while the rest of the fallen blocks were contained by the small depression located in front of the wall. A subsequent, later episode was a lengthier process, during which parts of the soil embankment moved gradually downhill, also dragging down with it part of the wall.

A similarly shaped excavation, 1.88 m wide, and a little bit deeper (60/70 cm), was identified *c.* 90 cm in front of the enclosure wall, in S11, on the northern trench profile (Figures 40/FJ; 42/d). Again, no clear margin was identifiable towards the enclosure wall, as if it blended with the dark soil foundation beneath the wall. In S11, no slabs were found in this depression, only the debris of stone working covering its bottom, while the upper filling contained the stones fallen out of the enclosure wall. In this sector the enclosure wall was badly destroyed, surviving only to a height of 20 to 50 cm, with portions of its middle structure missing completely. Very probably, modern agricultural works were to blame, at least for some of its demolishing, as the upper part of the wall was found at less than 30 cm beneath the actual vegetal layer.

Another sector of the peripheral ditch was intersected by the southern profile of S2 (Figures 37/AB; 43); it

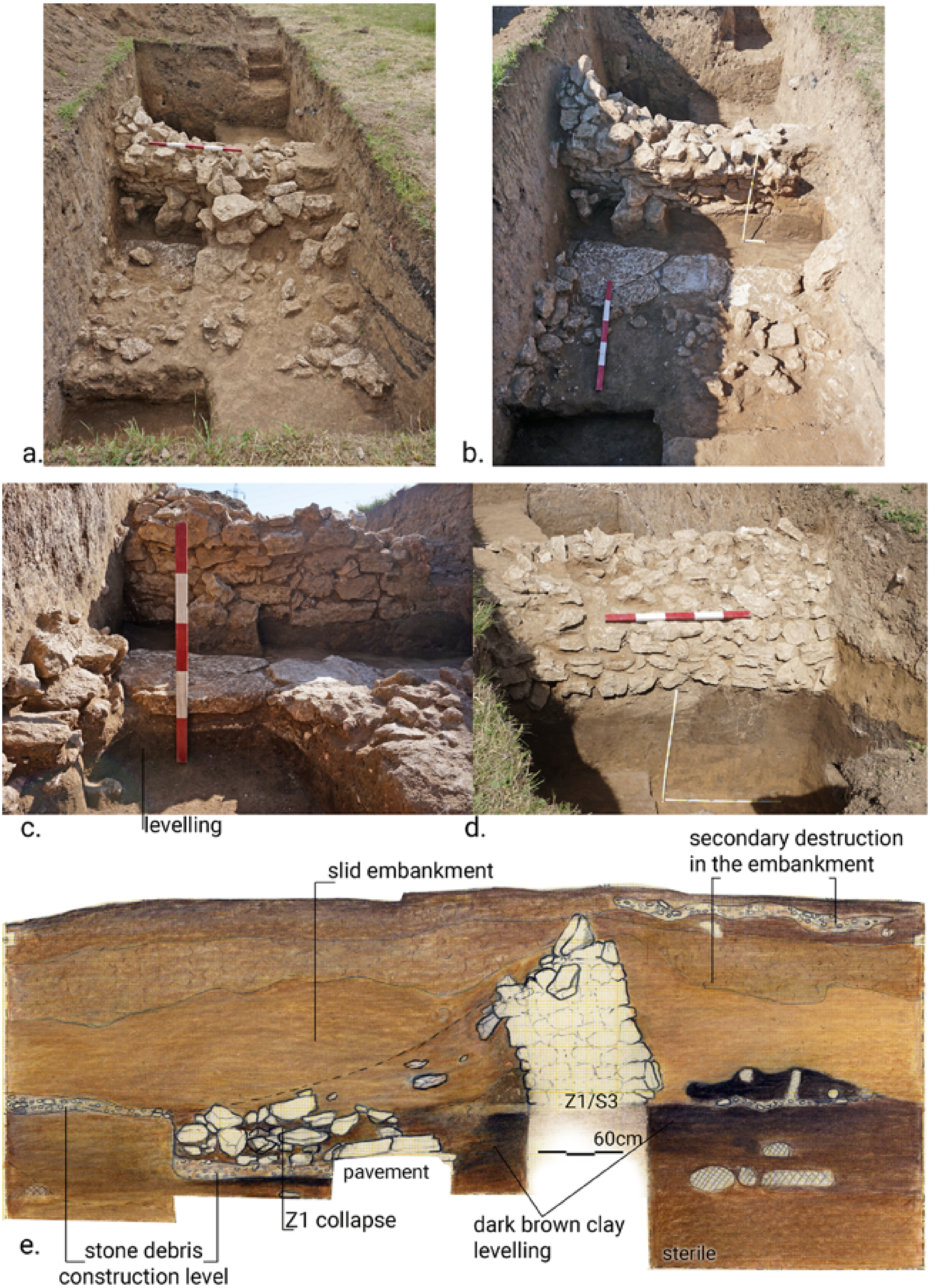


Figure 36. *Krepis* wall and surrounding exterior pavement in trench S3 (2017-2018): a-c) views from its exterior; d) inner face; e) stratigraphic sequence recorded on the eastern side of the trench (drawing by Fl. Marțiș).

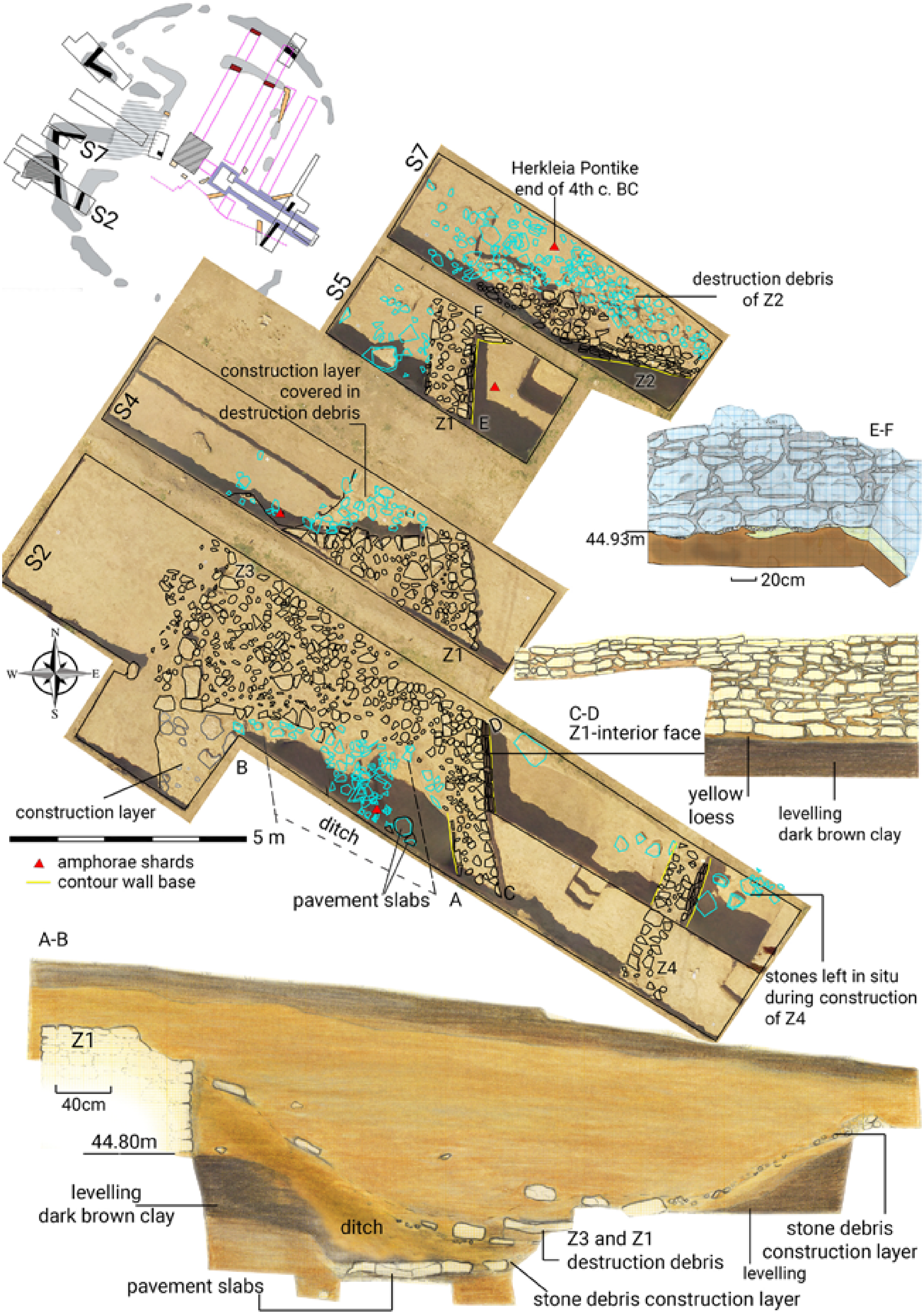


Figure 37. Western sector, *krepis* wall and adjacent altar; exterior ditch with pavement; red – fragments of amphorae.

Figure 38. Western sector; views of the *krepis* wall and adjacent altar (Z3).

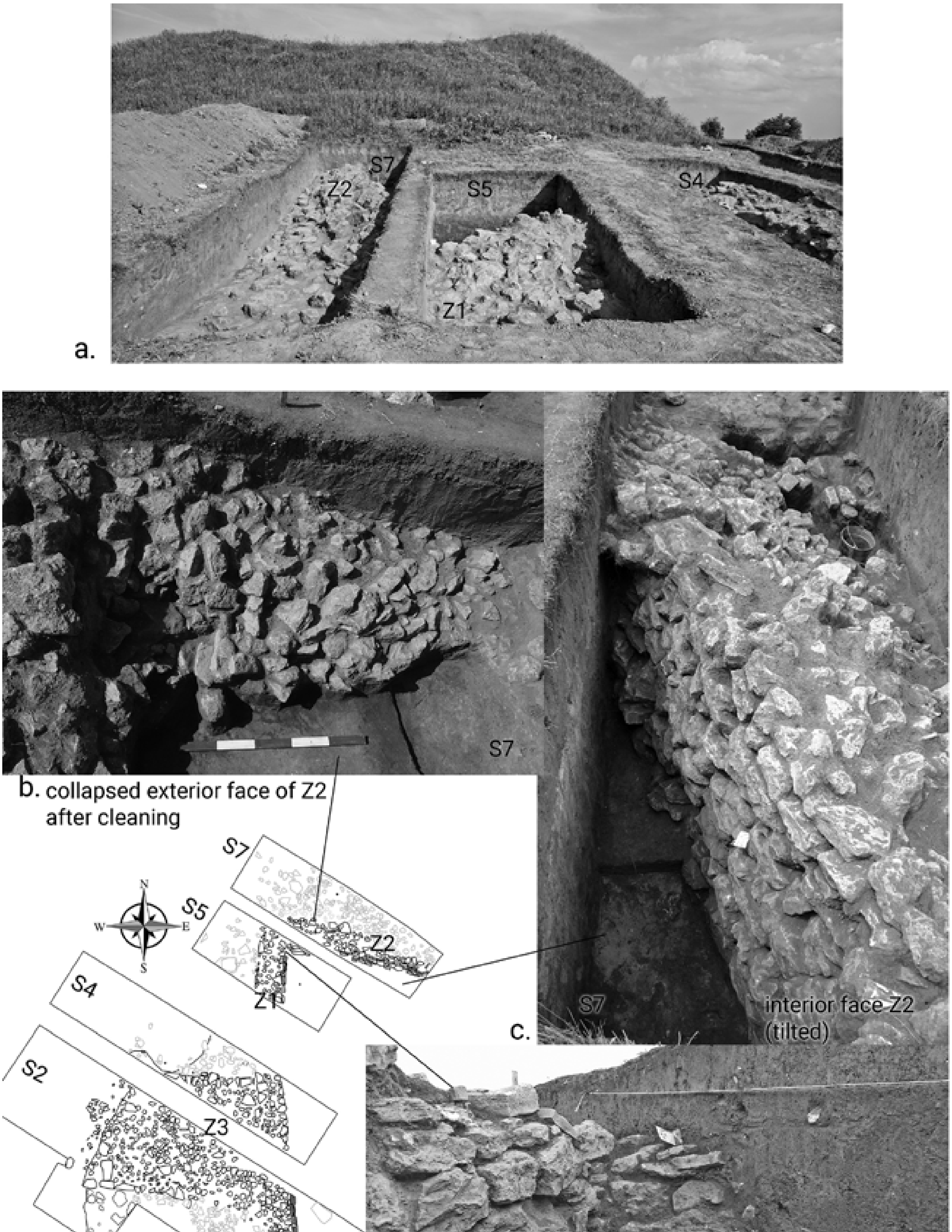


Figure 39. Western sector; the lateral wall (southern) of the inner courtyard.

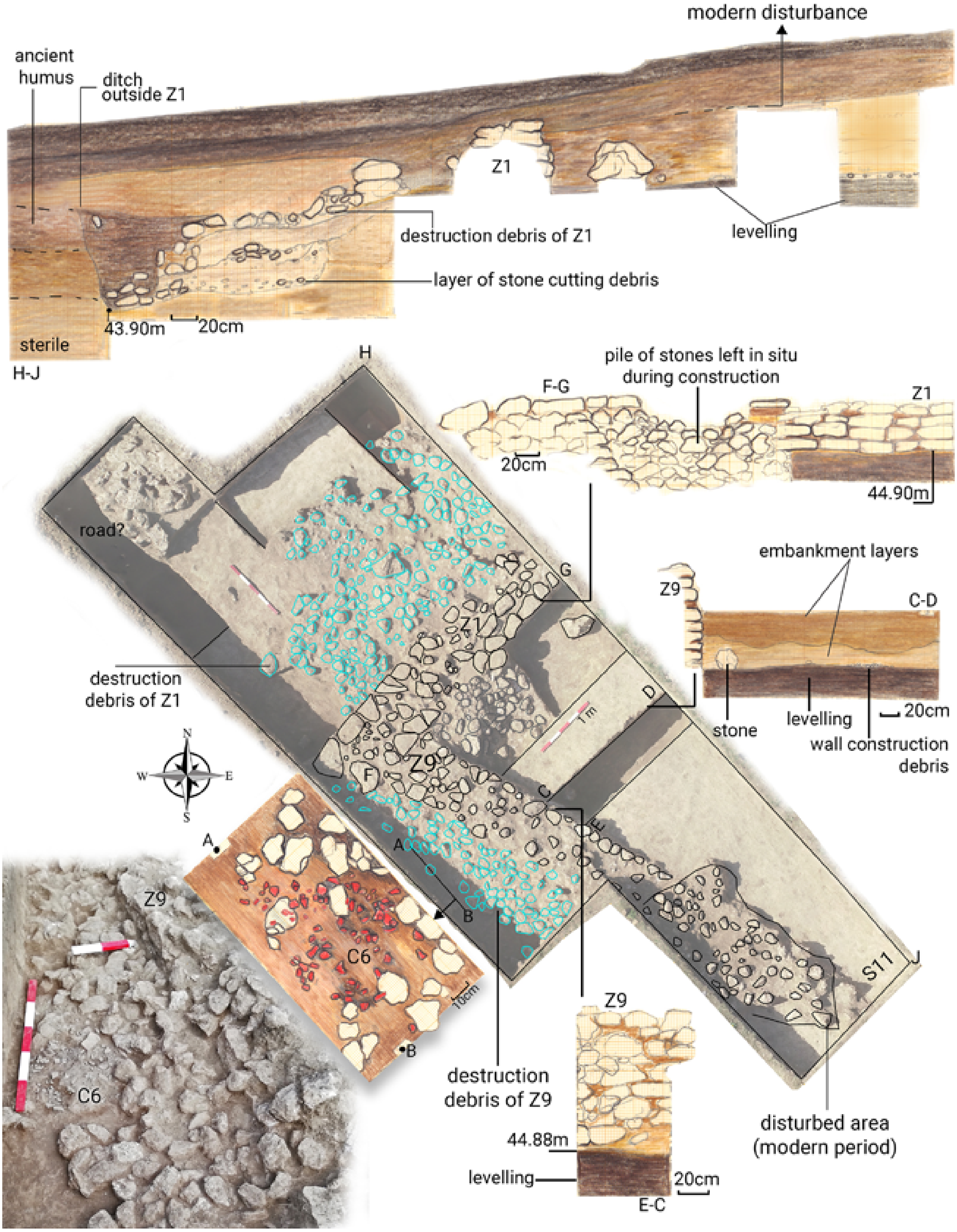


Figure 40. Western sector; *krepis* and the lateral wall (northern) of the inner courtyard in trench S11/2019; C6 – ritual deposit of broken pottery, under and among the debris of the wall (Z9).

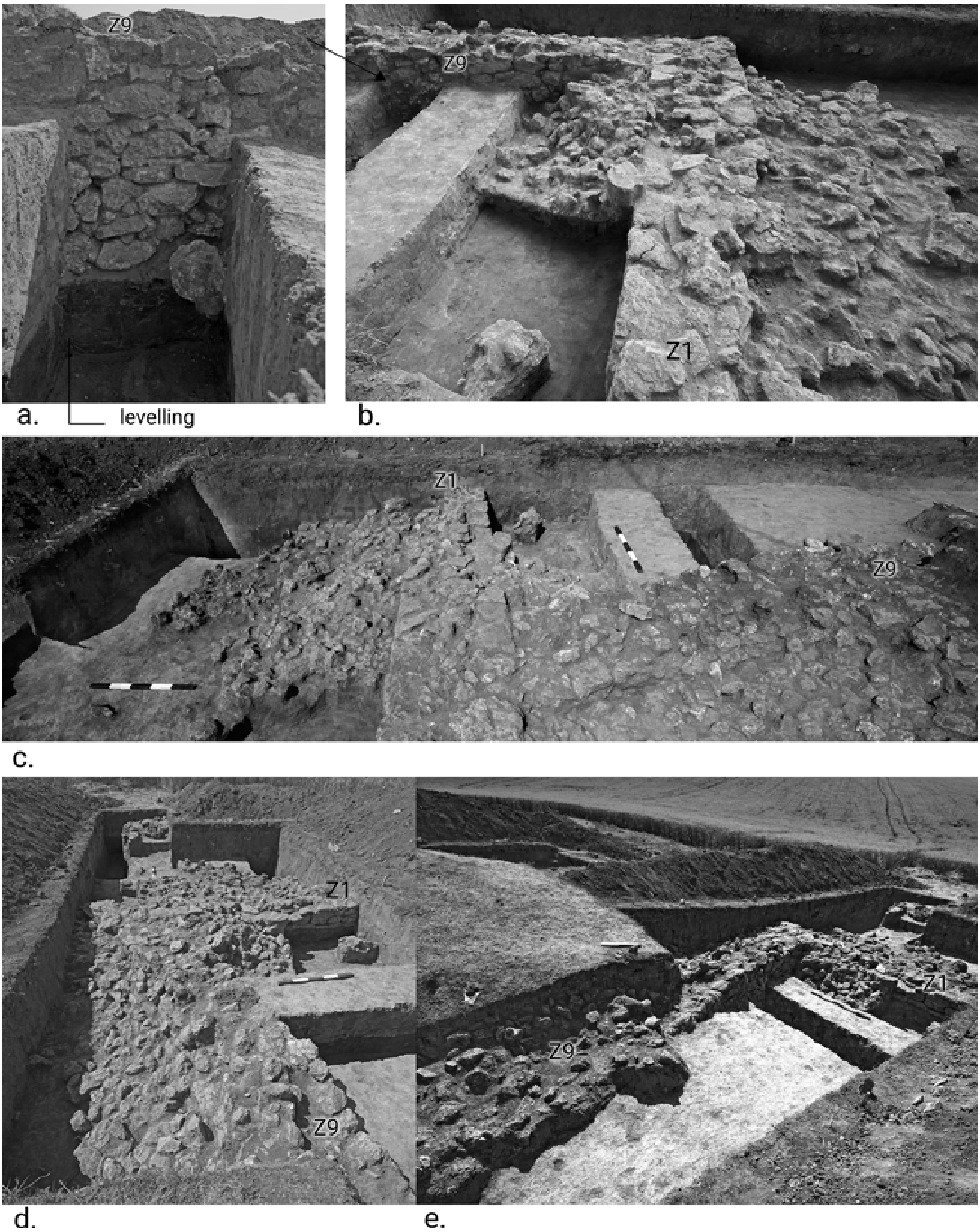


Figure 41. Western sector; *krepis* and the lateral wall (northern) of the inner courtyard.

was found 90 cm, on the exterior, from the enclosure wall, and its depth approximated as 60 cm. Up to this point, these dimensions are similar to those for S11. The exterior ditch margin (western) remained unresearched due to its covering by debris coming from the neighbouring stone platform attached to the wall (Z3, and see further). The southern side of this structure had partially collapsed, filling the ditch even since antiquity.

We decided to clean the ditch of this stone debris only on one half (the eastern) and preserve the other, anticipating a future conservation and valorisation project. The debris in itself is spectacular and may stand as compelling proof for the secondary evolution of the monument, giving a hint into its former level differences. The soil layers filling the ditch in this sector curved above its opening along a width of 3.20 m (W-E), suggesting that the ditch was intersected here obliquely, hence a larger cut span (Figures 42; 44). The layer of black soil underneath the wall extended towards the west. In contrast with the other sectors, this initial construction levelling layer could also be observed outside of the ditch, at least 4.75 m.

The impression is that the soil scraping here was not just a levelling but included an intentional, deeper dig, along the ditch outline, with the black soil levelling made along the entire surface, including inside the ditch. This difference in foundation treatment may be explained by the proximity of the stone platform (Z3), underneath which a compacted base had also to be built. At a later time, after the platform (Z3) had collapsed, a part of the embankment – a thick layer of light-brown loess – slipped down the slope, dragging along inside the ditch, by then partially filled, the top of Z1 wall. On the flat bottom of the ditch, in S2, margins of limestone slabs, similar to those preserved in S3, were clearly visible along a 1 m wide section of the profile (Figures 37/AB; 43). Interestingly, the absolute elevation level for the walking level on the pavement in S2 is identical with the pavement in S3, even if the base wall in S3 stands 70 cm lower. In S3 the difference between pavement and wall base was 20 cm, while in S2 it was 87 cm. In S11, even if no slabs had survived, the absolute elevation value for the bottom of the peripheral ditch level is only 3 cm lower than the pavement top in S2 and S3, suggesting that here also the pavement respected the unitary levelling system.

Despite some small differences, which can be explained by taking into consideration various building necessities (like terrain variations or the existence of neighbouring structures), the archaeological observations made on the exterior of the *krepis* wall in the three mentioned sectors, distributed along the 66 m length, seem consistent. This supports the interpretation of the tumulus construction process as done according to a well-established working plan, following a clearly dimensioned design. The vegetal soil scraping and replacement with beaten foundation was not made randomly on just any surface. It was reserved strictly for those areas covered by constructions: embankment, walls, platforms. At least for the northern and western portions of the *krepis* we can presume they were doubled on the exterior by a slab pavement fitted in a shallow drain. The diameter of this ditch (taking into consideration its exterior margin) can be approximated at 57.8 m (Figure 43).

On the same layout of the peripheral ditch we noticed two further traces of shallow terrain scraping, however not filled with black soil and not bearing the remains of stone cutting: one in S4 (to the north of Z3) (Figure 42/e) and the other on the southern profile of S11 (Figures 42; 43/c; 47/b) – both, more or less closer to the *krepis* gate. They did not contain stone cutting debris but were filled with clean yellow loess (possibly the embankment that had slipped down?).

The ditch can be observed also on the ERT plot as a conductive anomaly (Figures 9; 47/c). The geophysical data seem to suggest that it encircled the mound, even in front of the *krepis* gate. More excavation is needed however in these sectors to clarify how exactly the space in front of the opening was treated. An extension of trench S10 might help to investigate this possibility further. Inside trench S10, in the area of the 'gate'/walled inner courtyard, the original vegetal layer was intact, no soil scraping or traces of the dark, compacted construction levelling were identified (Figure 46).

An open space/walled inner courtyard for ritual food offerings (enagismoi)

Some of the smaller interruptions in the ERT anomaly corresponding to the enclosure wall proved to be, when excavated (for example in S11), just areas were the wall was affected by later intrusive elements, including ploughing or the use of excavators, which caused its partial dismantling (Figure 40/HJ). The largest disruption visible in the WNW sector was, however, confirmed to be deliberate, projected from the start by the ancient builders. It measured around 13 m in width on the exterior arch (Figures 34-35; 44). In the area of this opening there was never an embankment (Figure 46). The space was left 'open' for at least 7 m towards the inside of the mound (as seen in S10). On this unbuilt part no levelling with dark brown clay was found and no scraping of the vegetal layer. The original humus was in place. The sediment covering nowadays the former open space is the result of the gradual erosion and repeated soil slip from the central part of the embankment towards the mound's base. The observed

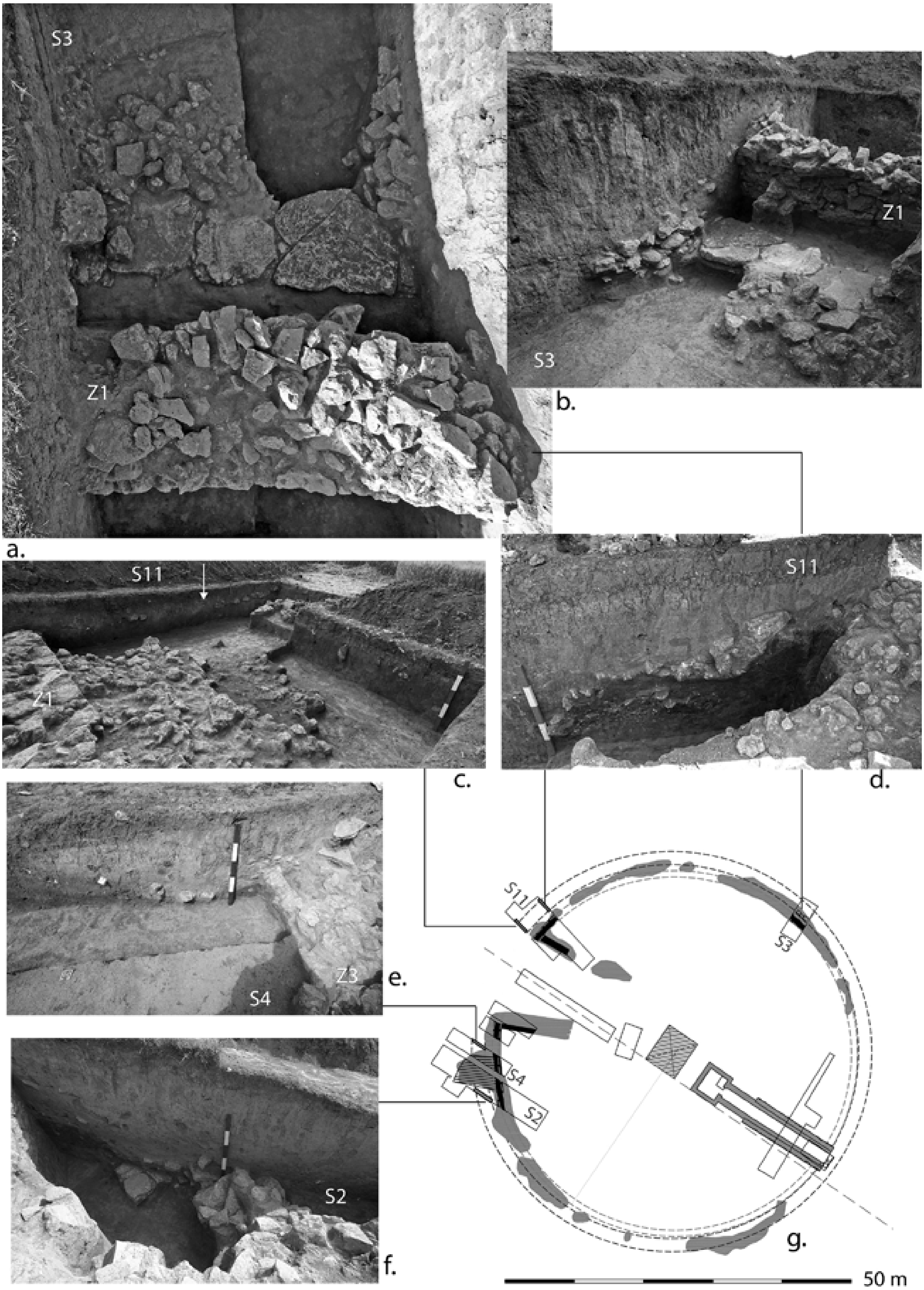


Figure 42. Map of the excavated sectors of the exterior ditch paved with slabs (a, b, d, f) and of the excavated sections filled with loess (c, e).

Figure 43. Western sector. Ditch on the exterior of the *krepis* in S2, paved with slabs, filled at a later time with the debris of the altar.

Table 3 Absolute elevation values for the funerary ensemble components (Black Sea 1975 reference).

Element	Function	Trench	Base (absolute elevation)
Z1	Enclosure/*krepis*	S3	44.12 m
Z1	Enclosure/*krepis*	S2	44.82 m
Z1	Enclosure/*krepis*	S5	44.93-44.99 m
Z1	Enclosure/*krepis*	S11	44.90 m
Z2	Support wall for the open space	S5	44.93 – 44.96 m
Z2	Support wall for the open space	S7	44.87-44.97 m
Z9	Support wall for the open space	S11	44.95 m
C5b	Ritual meal offering in the open space	S10	44.95-45.06 m
C5a	Ritual meal offering in the open space	S10	44.78-44.88 m
C6	Ritual meal offering in the open space	S10	45.09 m
Z3	Stone low platform/altar	S2	44.95 m
Z3	Stone low platform/altar	S4	45.00 m
Z4	Reinforcement wall for the embankment	S2	44.80-44.90 m
P1	Funerary chamber Plinth (walking level)	S9	43.46 m
P2	Slabs on the bottom of peripheral ditch	S3	43.93 m
P3	Slabs on the bottom of peripheral ditch	S2	43.93 m
P4	Bottom of peripheral ditch	S11	43.90 m
P5	Slabs – *dromos* II entrance	S8	43.78 m
L0	Upper part of initial levelling	S1	43.78 m

layers in this sector (four of them) are continuous on a documented length of 13 to 7 m, a stratigraphy which is in total contrast with the mound building style based on assembling monticules of curved, thin and contrasting looking layers, observed in other trenches. The topsoil layers (*c.* 1.7 m thick deposit) and large stones found in S10 were very probably thrown by looters, who, during the 18th-20th c. period, dismantled a large part of the socle and built a sort of access ramp to the stone source, following the most accessible slope of the mound (Figure 49/a, b, d).

The space left open in the embankment and *krepis* was bordered by lateral dry-stone walls adjoined in an angle of 80° degrees to the enclosure wall. These walls were built in a similar technique and with a similar width as Z1. Their elevation, however, raised gradually following the slope of the embankment located behind. Their bases stood at the same level as the enclosure wall, suggesting that they all were built at the same time before the embankment was heaped.

These two retaining walls were at first identified during the geophysical survey and afterwards documented through specifically opened trenches based on ERT results. Trench S7 investigated Z2, the southern support wall of the open space (Figures 37; 39), while trench S5 uncovered the inner corner Z2 made with Z1 (a corner made by simple adjoining not inter-weaving, Figure 39/d); in total, Z2 was observed along a length of 5.5 m. S11 was opened to investigate Z9, the northern support wall, along 4.6 m, and its connection with Z1 (Figures 40-41), while S10 explored the empty space between the two support walls. Both lateral support walls continue further inside the mound according to the geophysical data (Figures 9; 34).

A characteristic of these support walls (Z2 and Z9) was that one of the two wall faces, the one orientated towards the interior of the open space, collapsed. The exterior corner of Z1 with Z2 was practically destroyed, being covered in a compacted mass of rubble. The debris had fallen towards the interior of the open space, with stones spread over large surfaces. This is supplementary indication that no embankment stood in front of the opening in the western sector of the enclosure wall and that the collapse had been sudden and massive. The lack of support on the free wall side, corroborated with the pressing of the embankment from the other side, also caused a bending towards the exterior in the overall scheme of the walls, similar to what happened to Z1. Fragments of tiles of various types (see cat. J in Chapter 12), were found between the rubble of Z9 in S11, or in the layers filling the open space as a result of an embankment slide (in S10), may imply that this space was not *hypaethral*, but had some sort of light cover. More excavation is however needed to obtain a clearer picture in this regard.

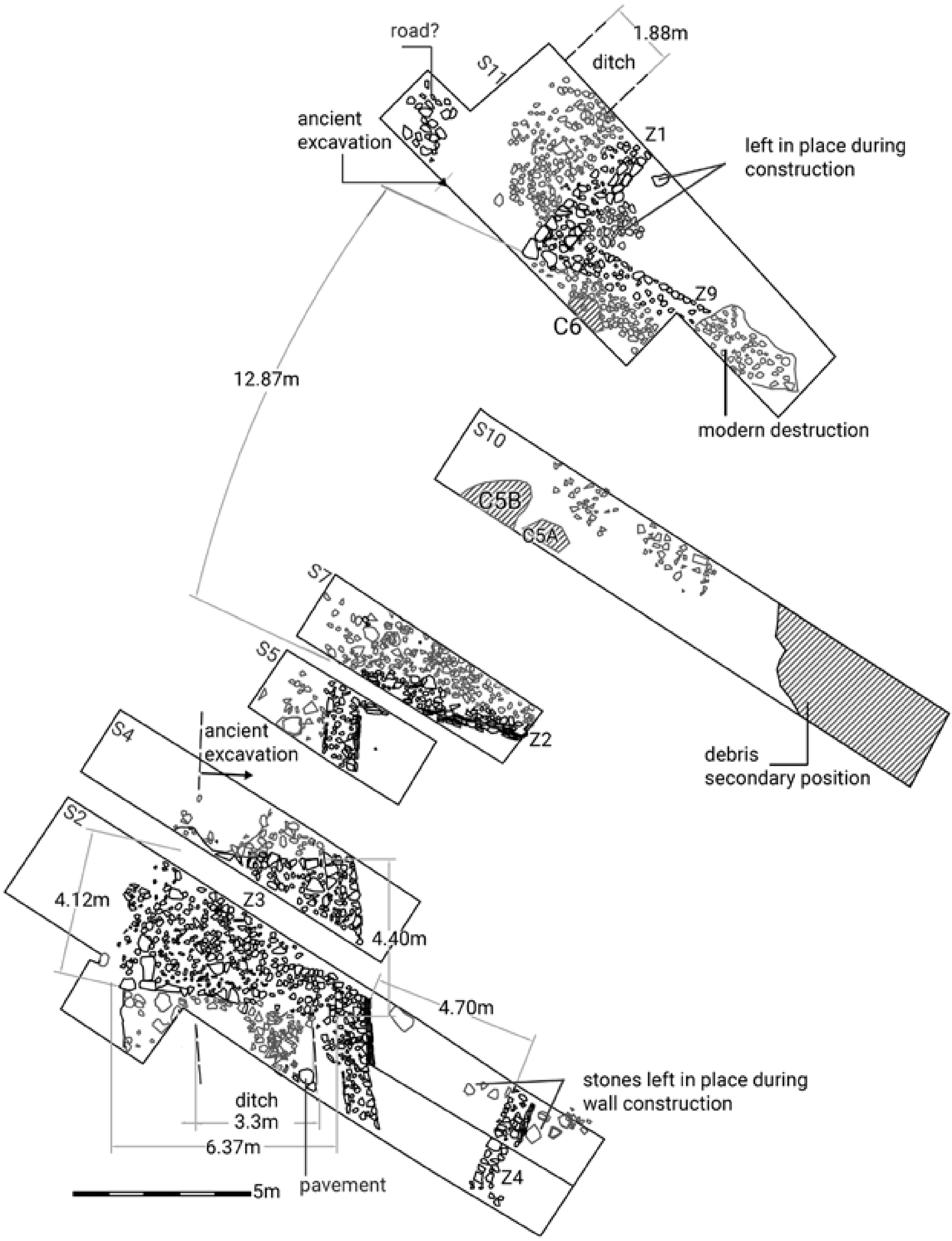


Figure 44. Inner walled courtyard in the north-western sector – *krepis* gate.

When we decided the location, shape and orientation for S10, the intention was to obtain a complete stratigraphic picture by establishing a connection between the enclosure wall (Z1) and the socle – exactly in the middle of the space free of the embankment. The ERT data revealed a large resistive anomaly in the remaining embankment sector, in front of the enclosure wall opening (Figure 47/c). We expected to find a second grave or an access structure (ramp, stairs, pavement) connecting this *krepis* opening with the socle. Unfortunately, S10 was not finished in the available time and we still do not know what this resistive anomaly represents (Figure 50). What the excavation has revealed, however, was that this open space, located inside the mound's perimeter, in the north-western part, was not previously scraped and reinforced with dark beaten clay; it was used instead as a place to make food offerings and libations on the occasion of the burial, or at some subsequent festival dedicated to honouring the dead (Figures 45-46; 49/c).

Two such fragmentary pottery groups, mixed with burnt and unburnt animal bones, were partially investigated in S10. A thin layer of yellow loess (it is not yet clear if it was drained out of the mound or intentionally laid) separated agglomeration C5A from C5B, indicating a certain difference in the timing of their deposition (Figure 46/a, layer 4). As the yellow layer diminishes once it extends west, the depth difference between the two pottery groups becomes quite small. We assume that C5A was made directly onto an original vegetal layer, existing in this area (*c.* 44.70-44.80 m). This layer contained several isolated fragments of amphorae, including the earliest datable material of our excavation (cat. A 13) – a fragment of a north-Aegean amphora with alveoli at the base of the handle (second quarter/end of 4th c. BC). A third agglomeration of pottery fragments (C6) was found in S11, under the southern debris of wall Z9 (Figure 40).

The materials uncovered in these deposits belonged to small bowls, plates, fish-plates, lids, *kantharoi*, *unguentarium*, *guttus* – some of the vessels being covered with black or dark-brown lustreless glaze or just brown or red paint – described in detail by L. Buzoianu in Chapter 12. The serving vessels were found laid face down, like a carpet of shards. Mainly under the pottery, but to a small degree on top of them also, there were found several remains of burnt and unburnt bones of medium-sized mammals (goat, sheep, a rabbit and a horse – see Chapter 14 by A. Bălășescu), isolated charcoals and fragments of resin. Some of the fish-plates bore traces of secondary burning. The pottery agglomeration C5B – the latest – was covered with a layer of soil mixed with small, scattered stones and numerous amphorae fragments. These amphorae can be dated from the third quarter of the 4th to the middle of the 3rd c. BC. The majority, however, seem to fall in the interval of the end of the 4th - early 3rd c. BC.

The deposited vessels, because of their small size, and probably because of the soil weight, were found badly broken. As the fragments were not spread and mixed over a large surface area, we consider that most were initially deposited entire. However, a small number of vessels appears to have been broken and spread on the spot – especially in the case of C5A, which also contained a broken bronze ring with leaf-shaped bezel (see cat. 2 in Chapter 13).

In the conditions in which the tomb was looted from antiquity, and the excavations (both older and newer) made in other sectors, have revealed almost no materials from the building period, the situation recently encountered in the north-western sector of the mound in trenches S10 and S11 appears quite remarkable and relevant. The deliberate concentration of pottery groups inside the area initially not covered by an embankment, but delimited by lateral rubble walls, and the selection of found vessels' categories and their arrangement, are indicative of the commemorative functionality awarded this space. Under the debris of Z2 in S7, on the original vegetal layer in the north-western sector, we found two small amphorae fragments identified as of Heraclea Pontica, dated at the end of 4th c. BC - first quarter of the 3rd c. BC (cat. A 5). The earliest dated item originating from the *yard* area, not found however in a coherent deposit, is the fragment of a Sinopean amphora foot (A 8) from the third quarter of the 4th c. BC.

The stratigraphy in S10 revealed that these pottery assemblages were not the result of a single food offering event, but more probably stand as clues for taking into consideration a repeated ritual activity. The duration of this interval, if framed just by amphorae, suggests an activity which spanned from the end of the 4th c. BC, or very early 3rd c. BC, until a decade later, after the middle of the 3rd c. BC. The rest of the vessels can be dated anytime in the interval between the end of the 4th to the middle of the 3rd c. BC. The association in C5B of a black-glazed bowl decorated with stamped palmettes (not connected) surrounded by rouletting, with a black-glazed *askos* of *guttus* type, a plain rim bowl-*kantharos* with elevated double handles, and an *unguentarium*, also black-glazed, point to a date closer to 300 BC, a decade earlier or later. The large spatial spreading of the materials, especially amphorae, including in trench S7, suggests that the offerings could have been made over an area of at least 70 m^2, i.e. in the entire space between the two support walls of the open space. From this area only a small part has been investigated to date. It is very possible that supplementary excavations may narrow down the chronology. The deposits represent a

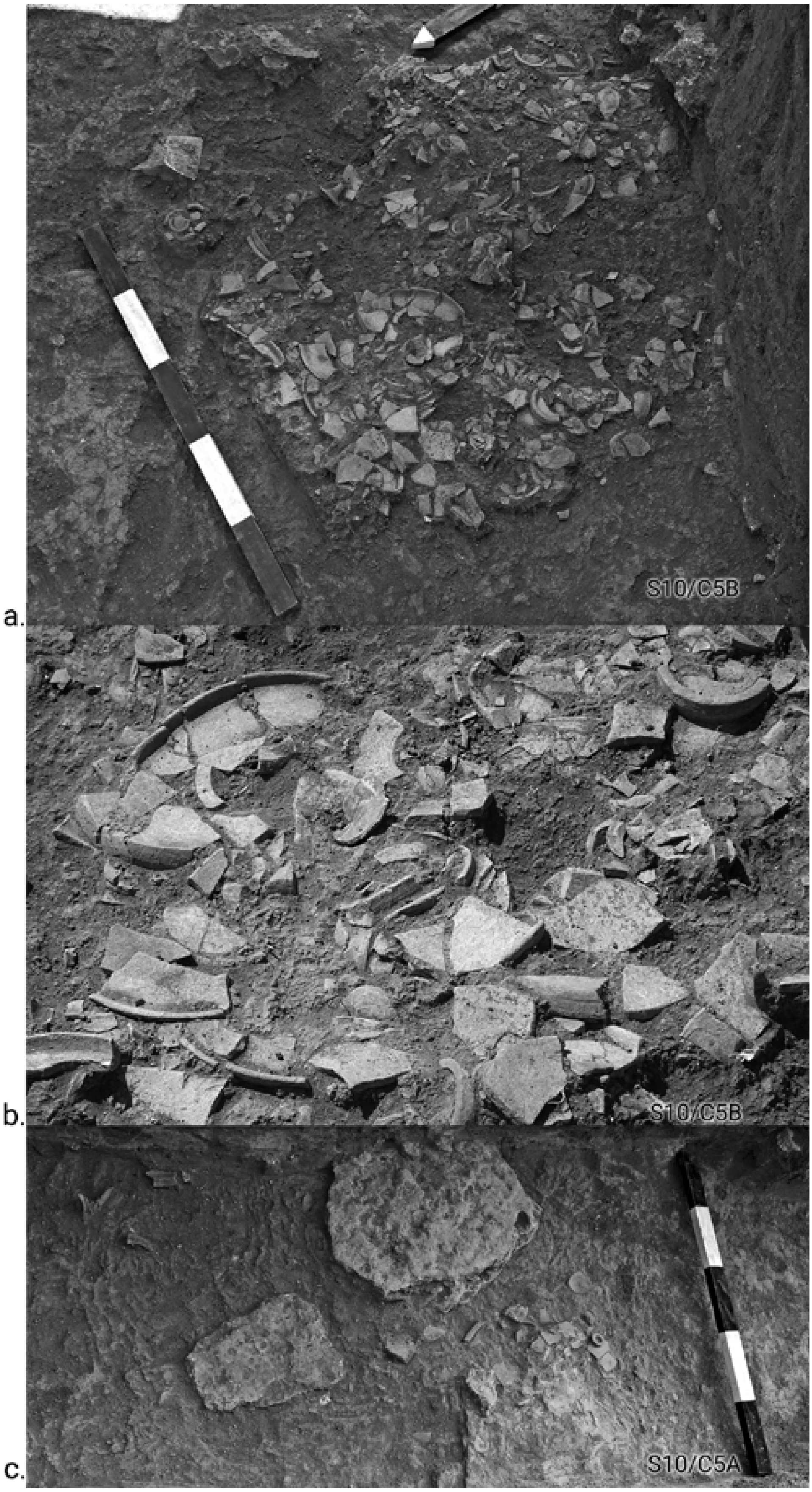


Figure 45. Trench S10, ritual deposits of pottery and animal bones.

terminus post quem non for the building of the enclosure wall, and thus the tomb.

Similar types of pottery groups regularly associated with fireplaces/pyres were attested in the cemeteries of Apollonia Pontica (Damyanov 2017) and Panskoye (Stolba, Rogov 2012). Repeated commemorative presence at the place of the burial, for 150 years, expressed through pyres, was observed at the *Stenomakri Toumba*, Aigai (Kyriakou, Tourtas 2015), starting from the middle of the 4th c. BC. Here, the pyres were made in the eastern area of the mound, the one facing the ancient road, in the vicinity of a stone base where statues and other funerary markers were exposed. Fragments of broken pottery (drinking vessels, bowls, some glazed, cooking and storage vessels), charcoals and animal bones, were found in three overlapped layers in the western side of the monumental Belevi funeral complex (which was not the side facing the ancient road) (Ruggendorfer 2016). Covering a Macedonian-type tomb, Belevi is the largest mausoleum in Asia Minor after that of Halikarnassus: it was presumably built for Antigonus *Monophthalmus* in the last years of the 4th c. BC.

The ceramic finds were interpreted as a demonstration of the importance food preparation and commensality had, in addition to libations in the form of donations of wine, water, milk, honey or oil, in the cult of the dead. These materials were dated to the early 3rd c. BC, but not later than the end of its first quarter.

Until more excavations are made in the remaining embankment segment, in the north-western part of the mound, between the open space in the *krepis*/walled inner courtyard and the socle, it will remain unclear if these food offerings (*enagismoi*) were given for the burial(s) that took place in the chamber tomb located in the opposite side of the embankment (but in an axial coordinated spatial reference), or in a second one, as yet unidentified, located much closer. The geophysical data sustain the existence in the previously mentioned unexcavated part of the mound, of a large, rectangular, resistive anomaly. The stratigraphy in S6 suggests, however, that the employment of a retaining layer of stones in the embankment could have also been the source of the anomaly (Figures 47-48).

The fitting of a large open space in front of chamber tombs, with facades built under tumuli ('a courtyard'), is attested in few cases in ancient Macedonia. There, however, more common were the simpler approaches of building wide passageways leading towards the tombs, with the lateral sides of the embankment plated with unbaked clay bricks (Derveni – Makridy Tomb, or Tomb II in *Megali Toumba*, Aigai – Drougou 2016), or just lined with mud and/or plaster (tomb with free-standing columns in *Megali Toumba*, Aigai – Drougou, Saatsouglou-Paliadeli 1999: 180-181). More monumental arrangements of these open yards were documented at Agia Paraskevi (Sismanidis 1986: 91-92), but in these cases the yards stood between the *dromos* and tomb. The tomb with Ionic façade in the Bella tumulus (Aigai), dated to the end of the 4th - early 3rd c. BC, had an opened space sustained by only one lateral retaining wall (10 m long x 2 to 3 m high). A second wall, transversal, closed the space at 15 m distance from the tomb (Drougou 2016). Remains of *enagismoi* deposits associated with burning activities were attested in this space.

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If we compare the absolute elevation values measured for the bases of the enclosure wall (*krepis*) surrounding the Documaci mound, we notice the following details:

1. The western sector, *c.* 30 m along the ideal circle outline, is quite consistent with values ranging mainly between 45.00 and 45.90 m above the Black Sea level. It is the same level on which Z3, the rectangular stone base/altar was built, but also Z2 and Z9, the support walls for the *courtyard*. In the western sector, only the enclosure wall segment researched in S2 and the base for the reinforcement wall Z4, located further inside the mound, discovered in the same trench, have their bases at an absolute elevation value which is lower by 10 cm. In contrast, the base for the *krepis* wall in S3 appears with 78 to 88 cm lower than the western sector. For the moment we interpret these differences as originating from the initial terrain topography, the preparation of which was meant to strengthen the base, and only to a lesser extent to diminish the elevation discrepancies.2. The agglomerations of vessels found in the *courtyard* area were just partially researched, therefore we have to keep in mind that we do not have for analysis all their relevant elements. From the level values we can deduce that their deposition happened at different times. The value for the initial walking level in the western sector seems to be that of C5A, the oldest of the deposits – around 44.70-44.80 m. This confirms the previously stated interpretation that in preparation for the raising of the heavy embankment the vegetal soil was scraped and then replaced with a well-beaten fundament to a level slightly above or identical with the original.

The base adjacent to the krepis

A large patrilateral stone construction (Z3) was found linked (not inter-woven, Figure 52/b-c) to the enclosure wall (Z1), on its exterior, in the south-western side of mound. It was at first detected in the ERT data and then excavated (2017-2018) in trenches S2 and S4, being considered the most endangered part of the

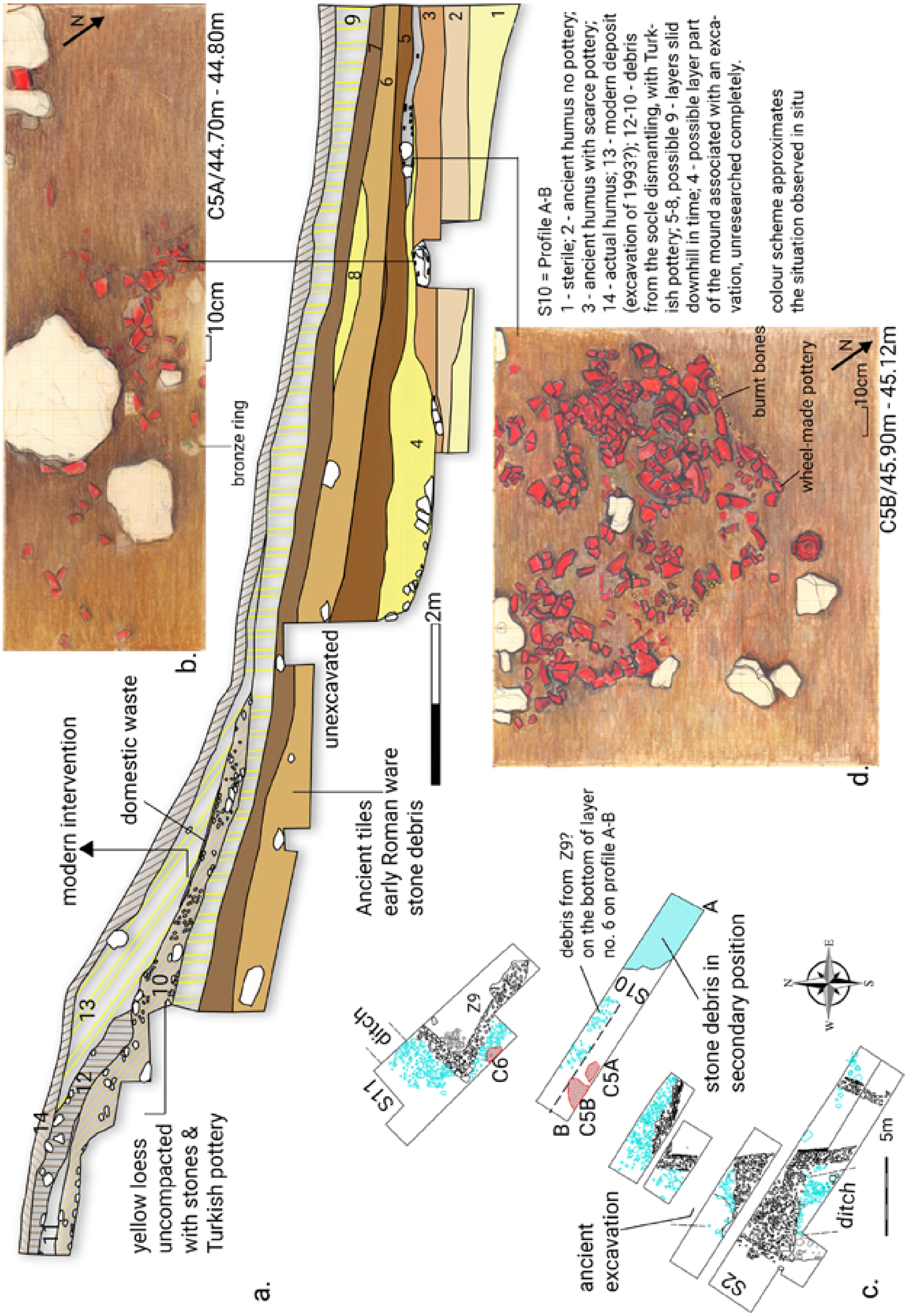

Figure 46. Trench S10 – cut through the walled inner courtyard used for offerings.

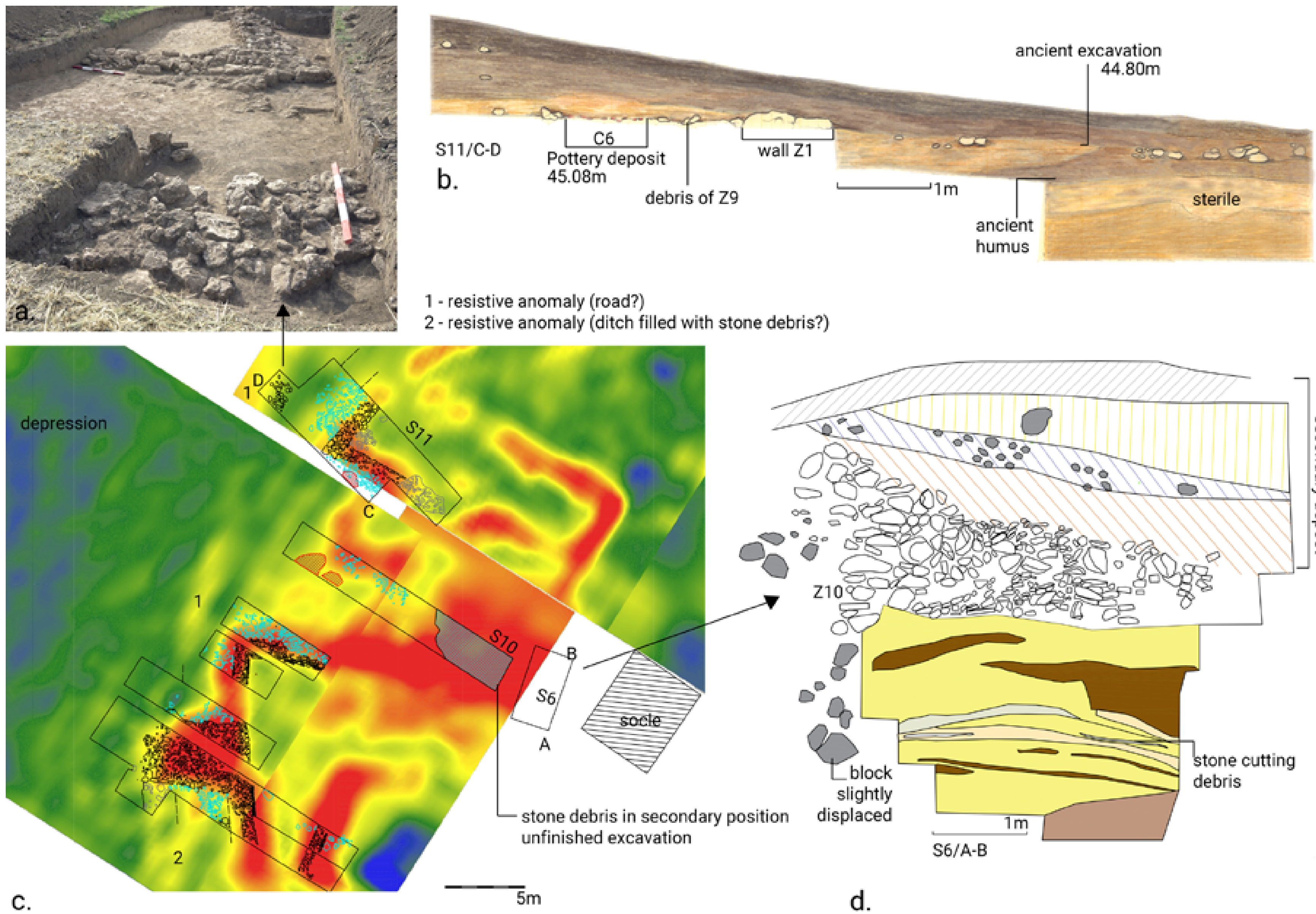

Figure 47. c) Resistive structures in the western sector of the mound; a) alley encircling the mound(?); d) platform near the socle(?); b) southern profile of trench S11.

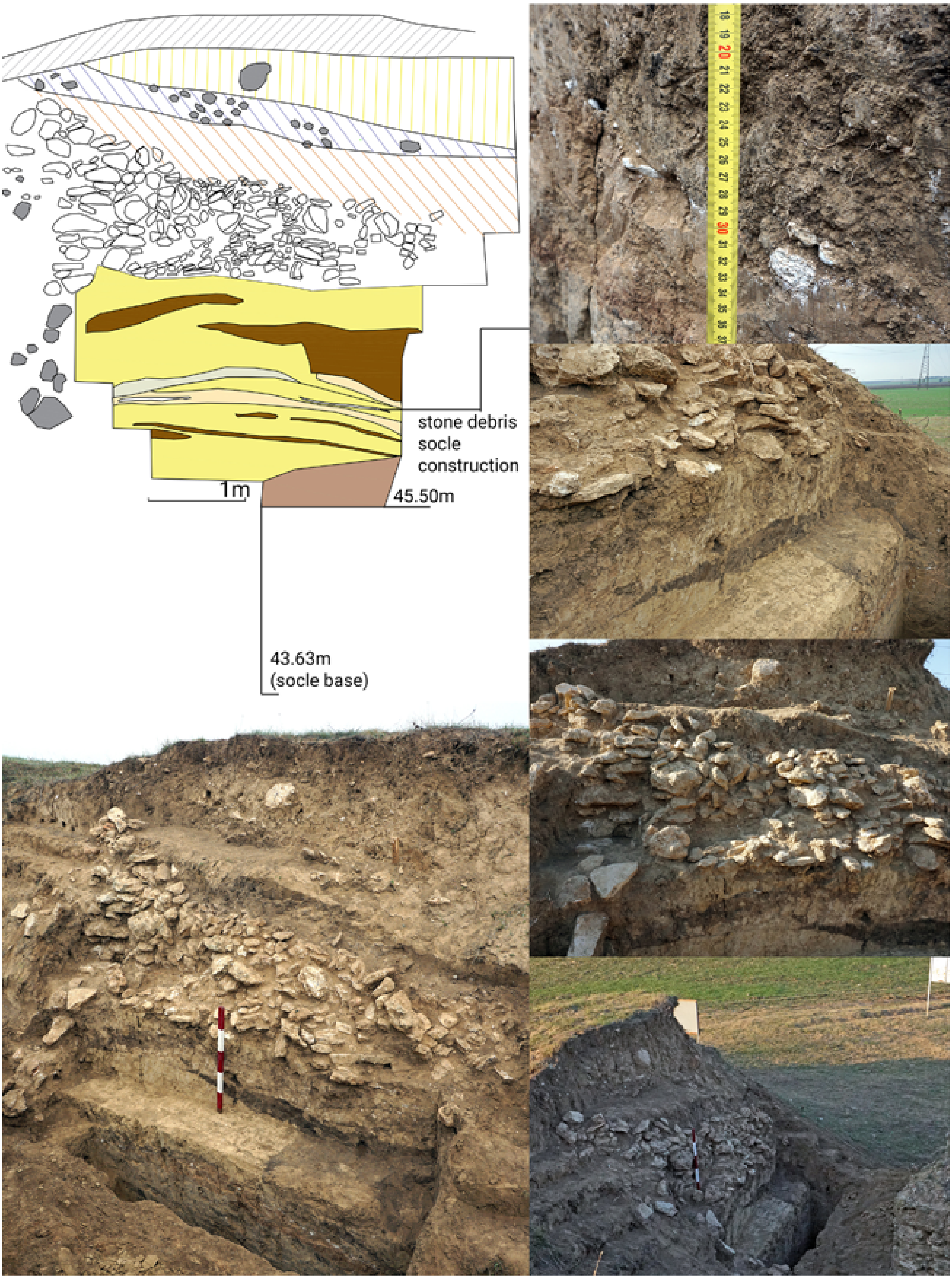

Figure 48. Trench S6, west of the socle.

Figure 49. Trench S10, remains of the modern period dismantling of the socle.

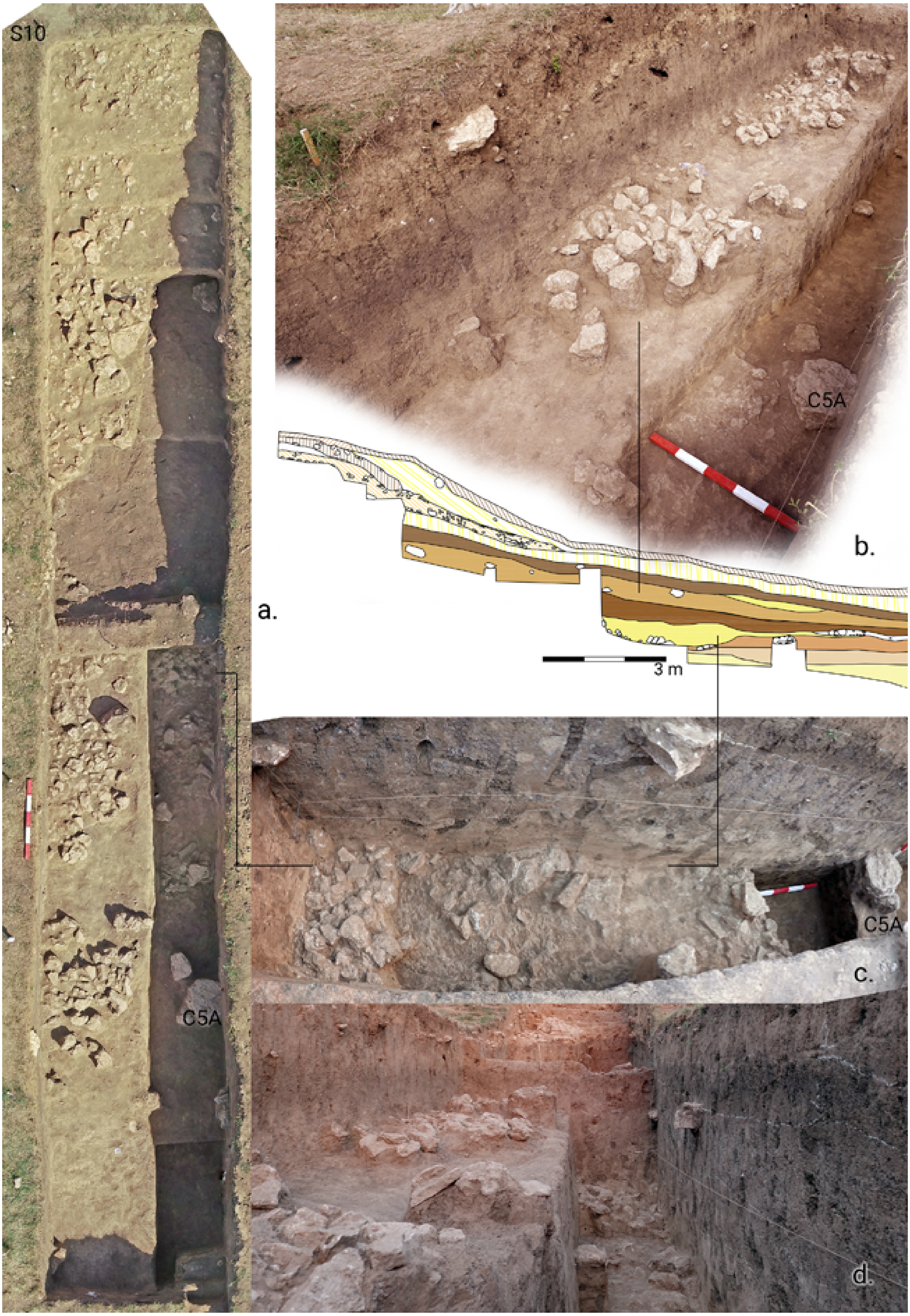

Figure 50. Trench S10, elements of stratigraphy; the extent of excavation in June 2019.

embankment. In 2017, at the start of the excavations, large blocks of limestone were scattered on the soil surface due to agricultural works.

The structure was built in similar technique as the enclosure wall and in identical material, with the slightly worked stones better fitted at the faces (Figures 51/a; 53). Even if the building technique is not parament-emplecton, a tendency to place slender slabs, some dressed on the long sides of the structure can be noticed (Figure 51/a-b). The interior was assembled of various sized stones and yellowish loess (Figure 52/a). It was preserved, at the moment of its discovery, to a maximum height of three elevation courses in the north-eastern corner (where it measured 60 cm in height, Figure 52/b-c) and on only one course at the western end. The western side was cut by modern agricultural works, while part of the southern wall had collapsed, probably even since antiquity, in the nearby ditch surrounding the enclosure wall (Figures 38; 44). Judging from the quantity of fallen stones it was not much higher than the three courses preserved in the north-eastern corner, perhaps one course higher. It was thus lower than the enclosure wall, standing around its middle height. It was also built above an initial soil scraping and levelling with black beaten clay. Therefore, it is quite certain that it was built at the same time as the *krepis* wall, as part of the initial architectural design and functioned in elevation, not as a foundation.

The only side conserved in its entirety is the one facing the enclosure wall. This measures 4.40 m in length. The southern side, is preserved on the longest outline, measures 6.37 m, while the opposing one (the northern) measures *c.* 5 m. The two longer sides are not parallel; thus, the described shape appears to be slightly trapezoidal, with the large base facing the *krepis* (Figure 44).

A fragment of a Sinopean amphora bearing a worn-out stamp (cat. A 7) was discovered very close to the surface in the stone debris of the dismantled southern side of Z3. There are insufficient readable letters to allow a confident restoration. All the possibilities range however in the interval between the last quarter of the 3rd and first quarter of the 2nd c. BC. This late date can be read in two ways: either as an indication that certain ritual activities continued at the mound for many decades after its building (or was just reiterated in a certain context), or as a simple reflection of the circulation along the ancient road located in close proximity, 100 years after its construction.

To determine the function of this stone-base/stone platform we took into consideration the following features: the orientation towards the west; the location adjacent to the mound enclosure wall, outside the embankment near the main road to which all the neighbouring mounds were aligned, meaning it was built from the beginning as a deliberate part of the architectural design, as a visible and accessible structure; its location in the vicinity of the 'open space'/*courtyard* where ritual meal offerings were made suggests as well a function in the sphere of ritual and commemoration.

A relevant indication about the functionality of structure Z3 comes from a series of finds in tumuli cemeteries of Greek communities living in Crimea. Individual stones (ritual tables) with carvings for pouring liquids were found adjacent to the stone walls encircling low tumuli. A particularity emerges in the predominantly selected position of these structures in the western/south-western sectors of the funerary enclosures.

At Panskoye I,[2] a large Greek site, at some point part of the rural territory of Chersonesos, 28 stone tables/altars with such carvings for pouring liquids were found (Stolba, Rogov 2012). The number of altars at each mound varied from one to four, and except for a single case, never exceeded the number of recorded interments. Most of these 'altars' were accompanied by concentrated areas of amphorae fragments discovered in front of them. Isolated stone tables are also known from the Olbia (Papanova 2006a) and possibly Orgame (Lungu 2000: 116, Figure 5.4) cemeteries. Strong similarities between Panskoye I and the Documaci mound can be observed also in the case of the pottery deposits found in the vicinity of the *krepidae* in various sectors or on the surface of their embankments, consisting of the debris of ritual meals and including pottery categories such as perfume containers, drinking vessels, and fishplates (Stolba, Rogov 2012: 43, Figure 2.43).

A series of finds in the 4th - 3rd c. BC cemetery of Callatis (Figure 54) can be advanced as main analogies for the practice of attaching stone-built platforms to the funerary enclosures or just in association with a group of family graves (Alexandru *et al.* 2017; Sîrbu, Ștefan 2019). Burnt soil was often noticed associated with these structures. In the northern sector of the Callatis cemetery, the one which reveals the highest degree of spatial standardisation and concentration of elaborate funerary *semata*, two such stone platforms were researched in relation with oval stone enclosures. The tumulus labelled as the *Papyrus Tomb* (Preda 1961; *et al.* 1962), dated in the last third of the 4th c. BC (see cat. B1 in Chapter 3.3), had in the western sector of its

[2] This settlement, a short-lived site that arose in the late 5th c. BC as an Olbian fort, was destroyed *c.* 360 BC, from which time on it was subordinated to the city of Chersonesos, and ceased to exist abruptly *c.* 270 BC (Stolba, Rogov 2012).

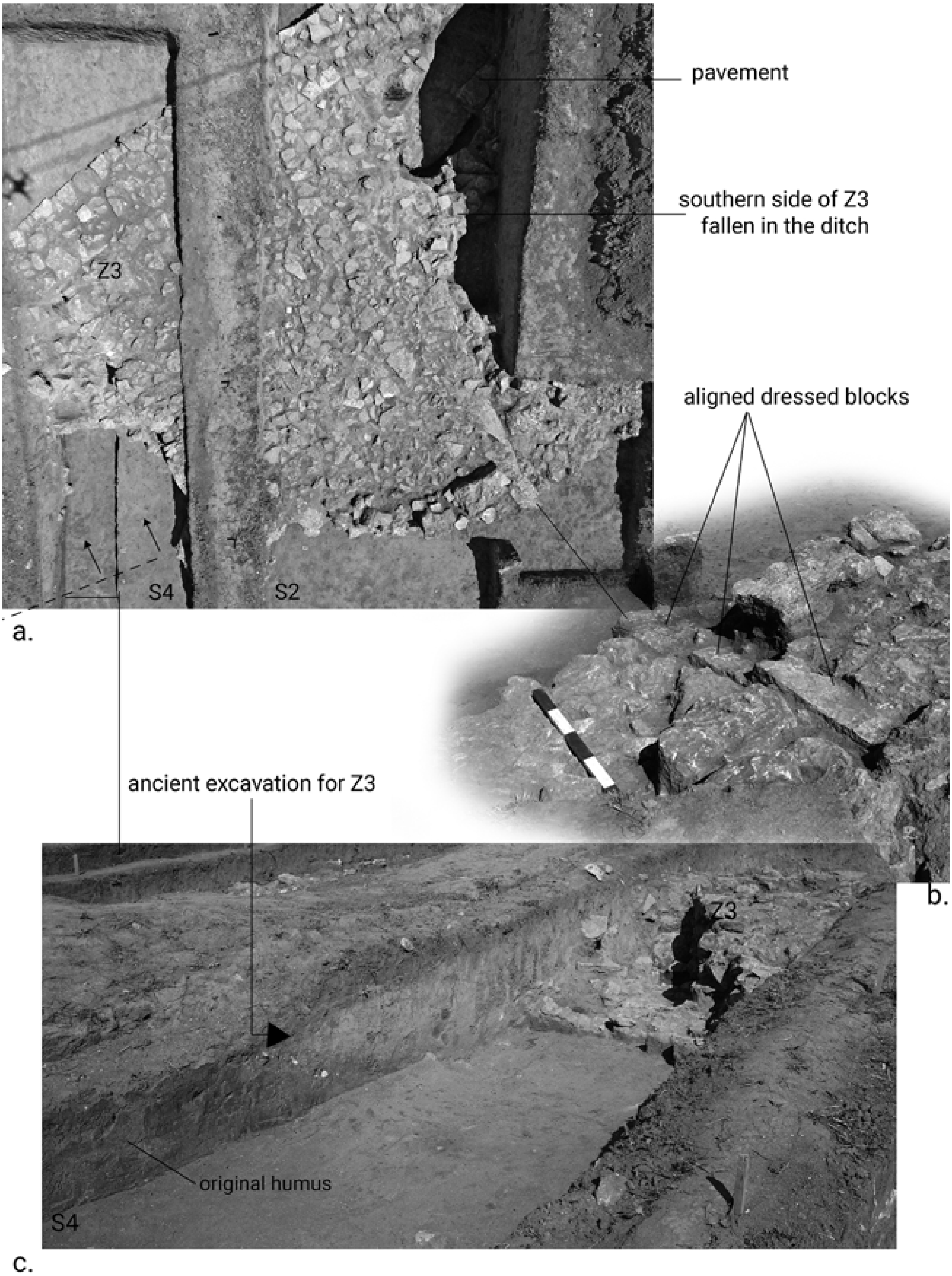

Figure 51. The base adjacent to the *krepis* in the western sector: a) an aerial image (by D. Ştefan).

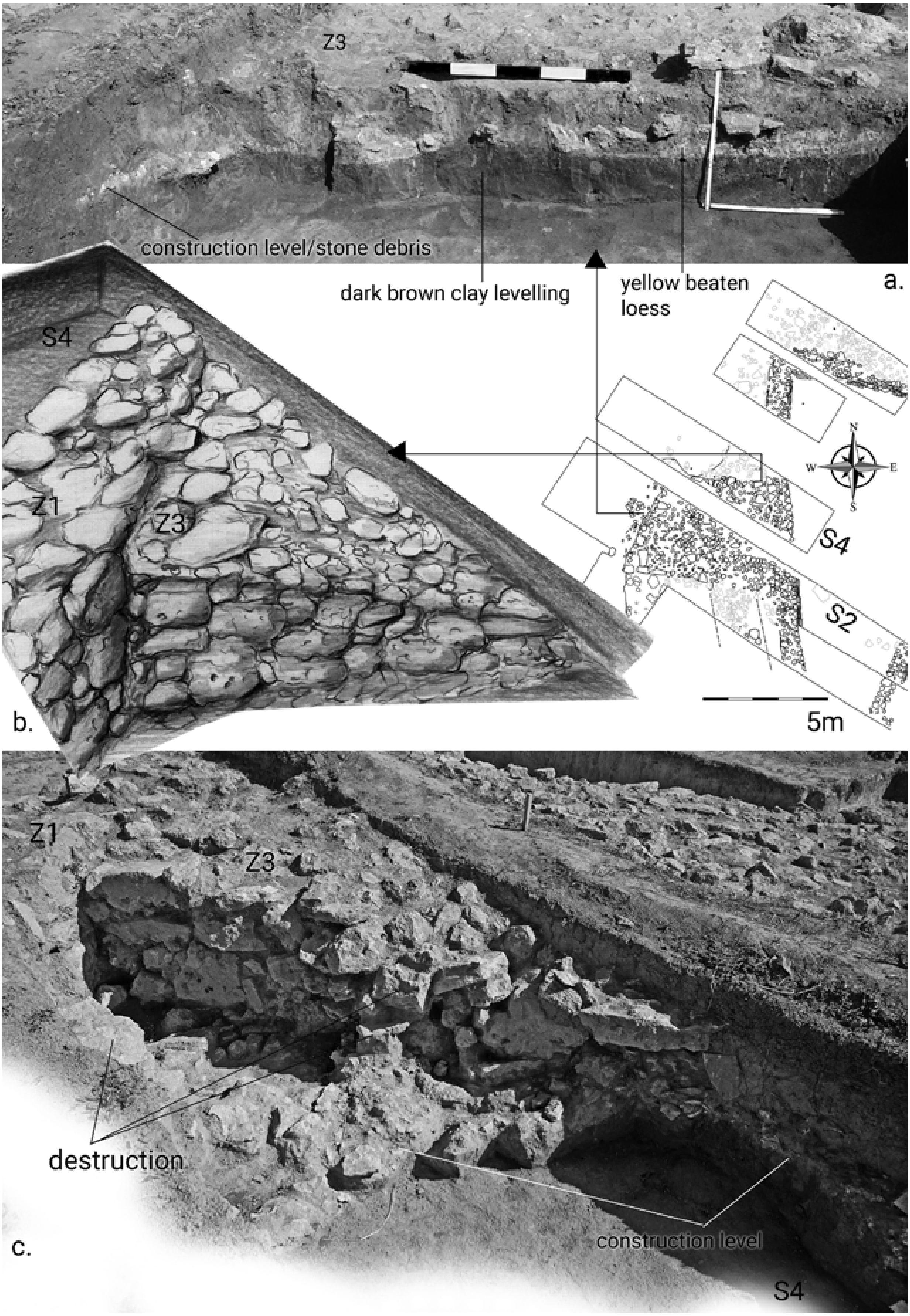

Figure 52. The base adjacent to the *krepis* in the western sector: a) stratigraphy western edge cut by agriculture works; b-c northern corner where it adjoins the *krepis*; b) drawing (by Fl. Marțiș).

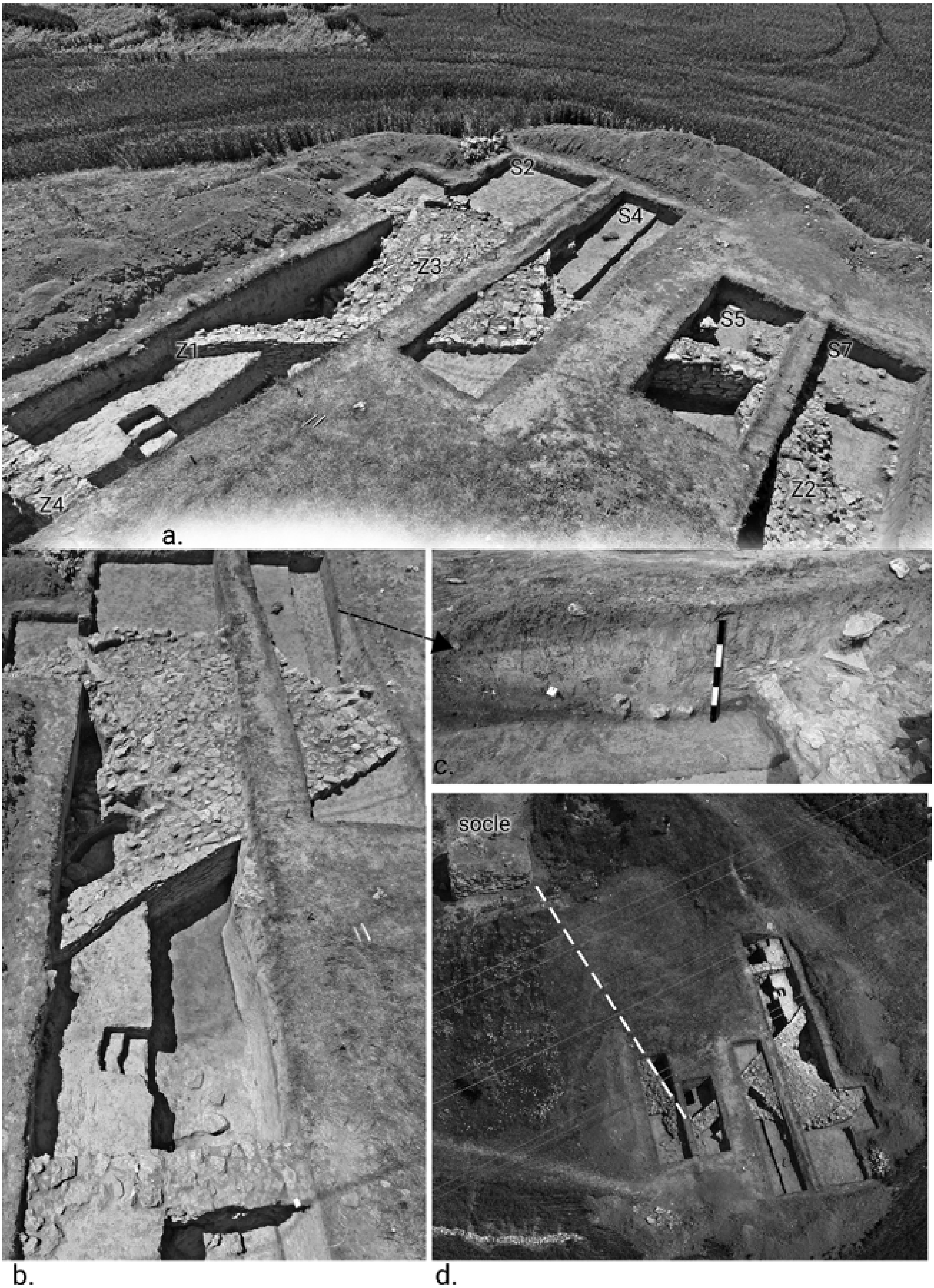

Figure 53. Western sector, base – altar(?) exedra(?) – adjacent to the *krepis*; a-b, d) aerial images (recorded by D. Ștefan); c) a shallow ditch filled with yellow loess excavated on the exterior of the base, on the same layout as the paved ditch encircling the mound.

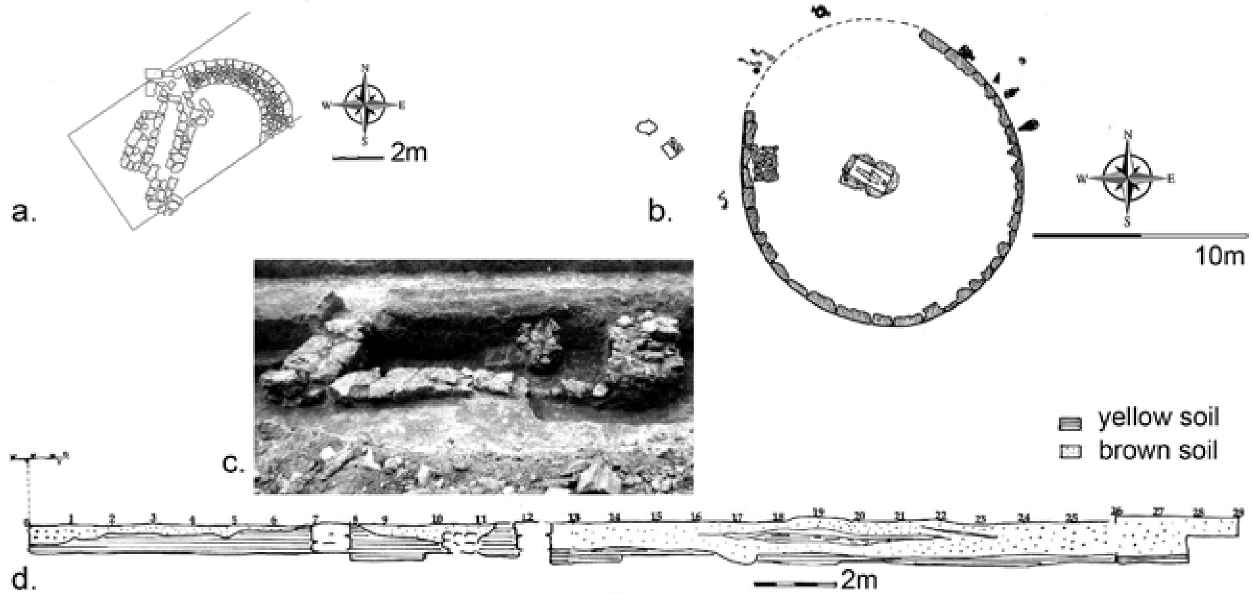

Figure 54. Callatis, the Hellenistic cemeteries, stone platforms attached to graves: a) B13 (Chapter 3.3; after Alexandru *et al.* 2017: 230, pl. II); b) B1/*Papyrus Tomb* (after Preda 1961); c-d) walled structure and offering ditch in funerary area C4-8 (Chapter 3.3; after Ionescu *et al.* 2002: 246, pl. IV; 266, pl. XXIV).

perimetral stone kerb (measuring 13.55 m (N-S) x 14.20 m (E-W) m in diameter) a 1.5 m x 1.15 m rectangular stone platform attached towards the interior. In the vicinity of the *Papyrus Tomb* tumulus, more recent excavations (Alexandru *et al.* 2017: 220, 224, pl. VI.4-6; XII.4-5; XIII.5-11) have revealed another structure consisting of an oval wall, 1 m wide, 70 cm high, to which a stone platform was interlinked to the west (cat. B13 in Chapter 3.3). Both structures were built of stones linked with clay and were found partially dismantled. The platform, if entire, could have measured 4.2 m x 2.4 m, while the wall enclosure could outline an area of 6.67 m x 4.03 m. Pottery fragments from the Hellenistic and Roman periods were recovered linked to this structure. Beneath this structure, four layers of 'burning' (?) alternating with yellow clay were found, and no traces of burial.

Another rectangular construction associated with a group of five Hellenistic graves, including two cremation graves, a slab double-cist and a destroyed chamber tomb (?), of which only the first course was identified, was researched in the western side of the city (C 4-8 in Figure 15) (Ionescu *et al.* 2002-2003: 226-227, pl. XXIV). It consisted of a rectangular construction with three sides, made of limestone blocks and soil, measuring 5.70 m x 2.10 m on the outside (Figure 54/c-d); the recorded thickness of the wall, preserved to a height of two courses, was 0.90 m on the southern and northern sides and 0.60 m on the eastern one. Traces of burning were found in relation with it. Two ditches (7-8 m wide, at least 16 m long), containing 4th-3rd century pottery fragments, also suggesting a ritual function, were discovered nearby. The entire group could have been covered initially by a tumulus, levelled by the later spreading of the paleochristian cemetery. Among the materials found in the ditches (fragments of *kantharoi*, *fish-plates*, *guttus*, lamp, bowls, a bronze ring, a Tanagra statuette) we can mention a Sinope amphora stamp dated 270 BC (Ionescu *et al.* 2002-2003: 227).

Two more structures which could be interpreted as altars or constructions related to a cult dedicated to the dead (see Alexandru *et al.* in Chapter 3.3) were documented in the southern sector of the cemetery (area D in Figure 15). A three-sided stone construction, measuring 4.80 m x 5.50 m x 5.40 m, 0.40 m high, was discovered associated with a group of four graves (two pairs of cists dated late 4th- early 3rd c. BC) in area C4-8 (Figure 12) (Preda 1966: 137-146). The cist graves had rich inventories paired in an almost identical fashion – strigil and unguentarium in one grave and gold jewellery and bronze mirror in the second – suggesting the interring of couples belonging to the same family. The other structure, composed also of three connected stone walls, measured on the outside 7.20 m x 5.40 m. It was discovered in funerary area D7-22 (Chapter 3.3, Figure 15), on the southern shore of Lake Mangalia Lake, under the current shipyard (Preda, Bârlădeanu 1979: 105). Initially it was interpreted as a dwelling. Sixteen tombs were discovered in its vicinity, of which twelve were by inhumation and four by cremation. These graves from 4th - 3rd c. BC are quite similar to all those located closer to the city.

The documentation of just three sides (in all the five known cases from the Callatis cemetery) might suggest these structures were attached to something else – a

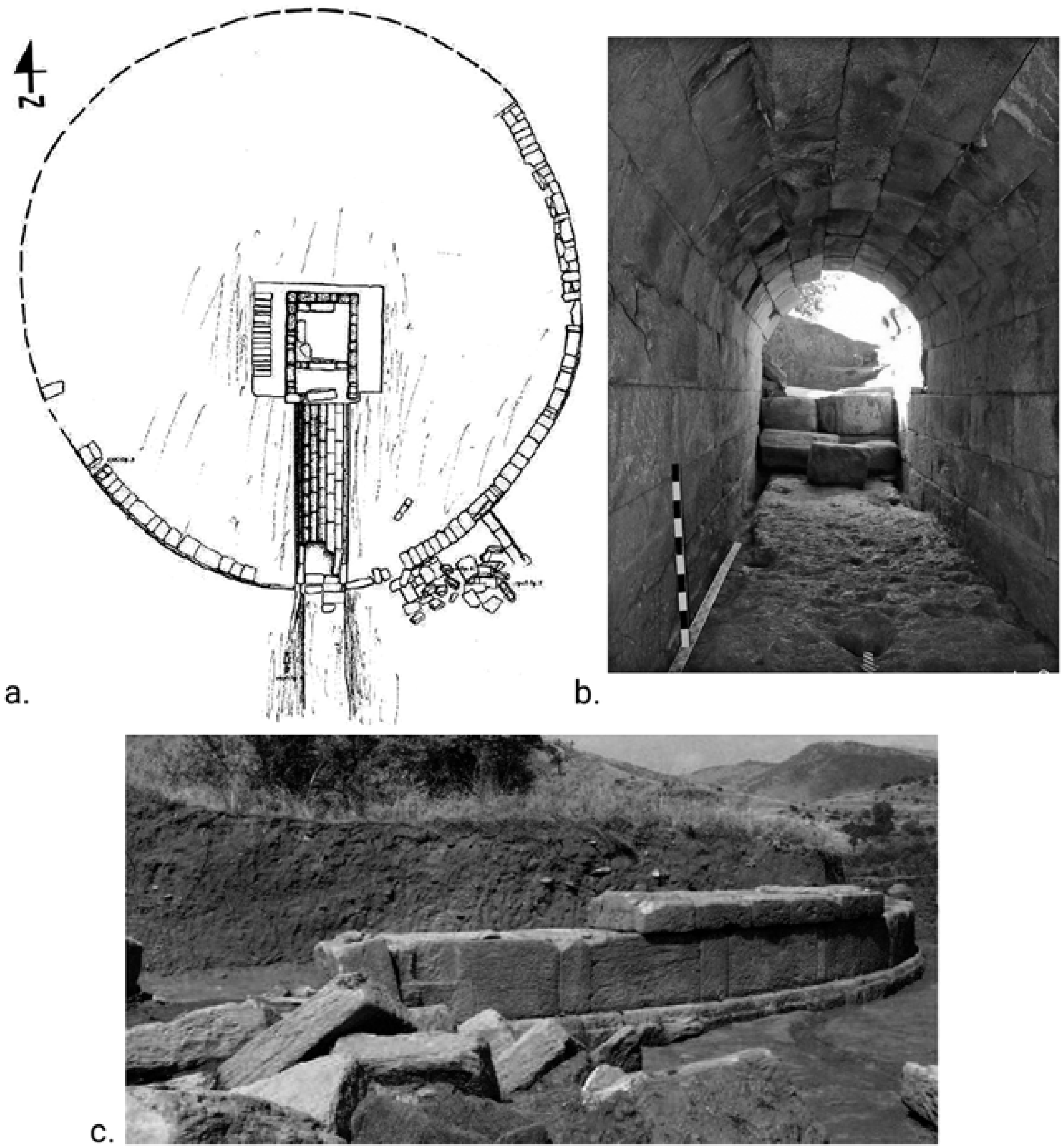

Figure 55. Pavla Cuka-Staro Bonce (after Lilchikj 2015: 34-35, 37).

mound or a kerb – which disappeared in time, or were not observed by the excavators. In two cases (C4-8 and B13 in Chapter 3.3) these walled structures were associated with traces of burning.

At Documaci have no indications that the structure was buried in the ground, making its interpretation as an *exedra* more difficult – a base for statues/monuments dedicated to the dead – as in the case of the Stenomakri Toumba at Aigai (Figure 86).

Perhaps the closest analogy comes from Pavla Cuka-Staro Bonce (Lilchikj 2015), where a rectangular stone platform was attached to the *krepis* of a monumental mound covering a Macedonian-type tomb (Figure 55). In this case the platform was located towards the SSE, in the vicinity of the tomb entrance. The tomb had a funerary chamber, antechamber, and long dromos (apparently not stepped) – all covered with semi-cylindrical vaults. It was found looted, but a general chronology in the late 4th - early 3rd c. BC was proposed.

Chapter 6
The Mound

Valeriu Sîrbu, Maria-Magdalena Ștefan, Dan Ștefan, Mihai Ionescu

Despite a long tradition of excavating built tombs of the Classical period or Hellenistic era tumuli in Thrace, northern Greece and Asia Minor, the archaeological interest in the study of their embankments (stratigraphy, geotechnical studies, pedologic analyses) was, unfortunately, rather the exception than the norm.[1] The tombs and their interiors have always represented the ultimate focus of the research. And in a way, it was a natural and logical predisposition, but which without tempering can lead to incomplete collected data. Due to this lack of interest, more than once, the techniques of excavation were based on the entire uncovering of the funerary chambers' exteriors and of their annexes, as if the tumulus layers were just annoying debris. This method led not only to a loss of valuable stratigraphic information, but also to the structural weakening of the masonry structures. The consistency of the vaults had the most to suffer, as they were initially designed to be reinforced by exterior lateral soil ramparts, either as pit margins or as added material. Once these supports were removed, the *voussoirs* started to slide apart. This was the case with the Documaci tomb also, which was completely stratigraphically separated by the surrounding embankment from the spring of the vaults and up, during the rescue excavations of 1993 (Figure 64). The trenches dug between 1993-1995 investigated and partially documented only small sections of the lower part of the embankment's layers on the northern side of the tomb, not always reaching zero level (Figure 62). The newer excavations (2017-2019) made at the northern edge of the tumulus (Figure 36) and those in the eastern sector, in the area of the tomb's entrance (Figures 68; 69, 143), improved considerably our understanding of the stratigraphy, also allowing a fresh look at interpretations of the older documentation.

Dealing with a looted tomb, the new research from Documaci essentially focused on the embankment. We wanted to clarify details regarding the building of the chamber tomb, i.e. was it made under the walking level or above, a detail often taken as relevant for distinguishing between typical Macedonian funerary designs and their regional adaptations. Of course, in direct connection with this we investigated whether this zero-level existed and if it was unitary (see Table 3). We considered that only a study of the embankment might offer clues about a possible enlargement phase of an initial tumulus, if this were indeed the reason for the constructive style differences between the two *dromos* sectors. To these early research objectives, the geophysical survey brought to the table even more themes, as other resistive structures were identified inside the mound.

Based on the previously mentioned research themes, we will further present data concerning: 1) Estimations of the embankment's initial shape and volume using the data documented for the *krepis* wall. 2) The micro-topography of the current mound shape using remote-sensing data. 3) Alterations and secondary evolutions (directly derived from the study of the relief and stratigraphy). 4) Techniques of construction and the sequence of implementation based on stratigraphic information derived first of all from our own excavations, but also from the older digitized drawings and geophysical studies. 5) Evidence attesting two construction phases.

This thematic division is, of course, an idealisation because in reality the data will be discussed in a combined and interconnected perspective, being relevant in more than just one aspect.

Unfortunately, we have not succeeded in including in our latest research programme, geotechnical drills, or analyses of the compacting degrees of the building layers, but we plan to have them in the near future.

Morphological analysis

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At the beginning of the KALLA project, in October 2017, before the opening of any new excavation, and after a thorough clearing of the vegetation (Figure 4/d; Figure 56), we recorded in detail the micro-topography of what was left of the mound and its surroundings. For this we created a high-resolution (centimetric level) digital elevation model of the terrain surface (DSM) using low-altitude aerial images recorded with an UAV.[2]

[1] The works of Diana Gergova and collaborators at the Hellenistic tumuli necropolis of Sboryanovo, in north-eastern Thrace, are examples of good practices (Gergova 1996; Evstatiev *et al.* 2005). More recently, see Mecking *et al.* 2020 for Yıgma Tepe, Pergamon. For a review of embankment features for tumuli in Macedonia, see Schmidt-Dounas 2016.

[2] DJI Phantom equipped with default FC300S camera, flown at 10 to

The timing was ideal as the neighbouring fields were vegetation free, the crops being gathered, and the land recently ploughed.

The analysis of the terrain model by visualisation at different angles and lights, and by measuring detailed elevation profiles (Figures 57-58), resulted in the following observations: 1) The fingerprint of the initial mound in the northern sector was still recognizable, suggesting that the base of the embankment had not been entirely levelled mechanically during the destructive event of 1993 – about 1 m of its initial height survived (this observation is also supported by the results of the archaeological excavations in S3). 2) The layout of the archaeological trenches excavated during 1993-1995 in the northern sector, afterwards refilled and never recorded on a general plan, could be better spatially approximated (Figure 57/c-d). 3) The exact contour of the areas mechanically excavated in 1993 in the southern sector become apparent. 4) The shape and volume of the relief depression located west of the mound were more clearly evidenced (Figures 58-59).

Taking into consideration the ideal shape of a circle with a 26.4 m radius for the *krepis*, we estimate that what we observe in elevation *in situ*, today, represents less than a quarter (*c.* 520 m*2*)[3] of the initial embankment, covering *c.* 2189 m^2 in surface area and *c.* 9000 m^3 in volume. Considering that the mound includes at present, due to erosion, areas which were not initially covered by a built embankment, the real preserved percentage of the original is probably even smaller.

The remaining heap has the shape of a semi-circular dyke. It is practically just a slice of the southern half of the mound, left over after the excavator had destroyed its southern periphery, and the archaeologists, in their turn, removed the soil all around the socle and tomb (Figure 59). The northern sector of the mound could have been partially levelled to a large extent even since antiquity, and being certainly altered during modern times before the 1993 event. The maximum preserved height difference is 6.2 m, measured in relation to the northern surrounding terrain (which corresponds well enough with the original zero ground of 45.00 absolute elevation – Black Sea reference). The longest preserved embankment axis is located to the south of the tomb and socle; it measures 40 m along ESE-WNW and 11 m wide N-S. Its southern side was abruptly cut by excavators. In S2 we documented the western end of this southern profile along 15 m. Its northern profile was cleaned by Georgescu (probably with an excavator), without reaching the zero-level, and hand-drawn in 1993 by Mihai Ionescu (Figure 63). The documented stratigraphic profile measured almost 27 m in length and 5 m in height. We resumed the documentation of the eastern end of this profile in S1 (on just 2.6 m section length), but we succeeded in establishing here a stratigraphic connection between the only preserved part of the embankment near the tomb entrance and the *dromos* covered with the gable roof. A second embankment segment raises to the west of the socle, from which it was mechanically separated by Georgescu when he searched for an 'entrance' in this second construction (Figure 65/c). It measures *c.* 30 m (NNE-SSW) x 12 m (W-E).

The shape of this incomplete embankment is the result, first of all, of the mechanical interventions from 1993 (Figure 30/b). The excavator dug deep into the southern side of the mound, while the soil was probably transferred completely to the construction site in Mangalia where it was needed. Judging by the measurements on the DSM, we expect that the intrusion went lower than the original ancient building layer, by *c.* 60 cm. A fragment of the *krepis* wall in the southern mound periphery was nevertheless avoided and left in place on higher ground, probably because it was an unwanted source of stone (Figure 58/a). The military dike, which currently raises less than 4 m east from the preserved embankment margin and just 7 m from the concrete door that closes the tomb's entrance, must have cut a part of the eastern side of the mound. It was around that time, between 1957 and 1976, that the mound seems to have lost 1.8 to 2 m in height (according to cartographic recordings). However, the military dyke is a huge structure (more than 200 m long, 15 m wide and 8 m high) and needed a significant quantity of earth. It was obviously built with more than just a segment of the Documaci tumulus. More probably the soil came from the interior excavation of the polygon, i.e. from the other side of the dyke than the one with the mound. Some destructions occurred but they were not so extended.

From the very few images taken during the subsequent rescue excavations, in 1993-1995, we can observe that the soil coming from excavations, especially from the cleaning of the west-east main profile was heaped at the base of the military dyke in a massive pile (very possibly also by mechanical means). This is an indication that the eastern extremity of the preserved segment of the embankment might now be combined with these secondarily deposited soil layers. One of the stamped amphora handles, the latest (cat. A 6), was found in the filling adjacent to the concrete door in this much disturbed layer.

50 m altitude.

[3] This is a very basic approximation attempt, without taking into consideration soil compacting. The reported area for the embankment was calculated without a perimeter of about 125 m^2, corresponding to the western opening in the krepis where ritual offerings were made and where excavations showed there was no initial embankment.

In the western sector, we can notice that the terrain corresponding to the *krepis* opening (the so-called *narthex/gate/courtyard*) is considerably lowered, sunken, and not respecting the inclination of the general slope of the embankment (Figures 56/c; 58/b). This is a further indication that this area was not initially covered by a built embankment. The research in trenches S10 and S6 have shown that at least 1.7 m of the upper deposit of the mound in the western sector is represented by materials in secondary positions as a result of a modern-era dismantling of the central socle (Figures 46/a; 49). These deposits consisted of layers of stones alternating with yellow loess mixed with shards of medieval green-glazed pottery and Turkish smoking pipes. Some large stone pieces, measuring up to 1 m in length, which were most probably ripped off from the socle masonry, were noticed in various positions in the composition of this secondary deposit, at the very top and at the bottom of the western mound slope.

How much, therefore, of this heavily disturbed heap of earth can be taken as representative if one attempts to reconstruct the original mound slope and subsequently retrieve the value of the original height? The known data in this equation is: the *krepis* layout, the absolute elevation values for the surrounding exterior pavement, the margin entrance in *dromos* II, with a known height of the roof and the slope of the mound in the highest preserved sector (even if with certain reservations due to consistent secondary interventions). A calculation (Figure 82) taking into account all these factors, with the slope at a minimum value – just covering the *dromos* II entrance roof – allows an estimation of an initial height of 9 m in relation to the entrance in the tomb, and +8 m in relation to the level of 45.00 m – the actual walking level north of the tomb, outside the perimeter of its *krepis*. This height fits also with data from older maps. The maximum height was considered the top of a truncated cone, not a pointy summit, because the central pedestal had to cut the top with a rectangular plane to sustain the exposed structure. It seems, thus, that the socle survives to just a part of its height, while from the initial volume of the embankment (at least 9,900 m^3) we have today just less than 25%.

These are however the smallest values – obtained for the smallest slope. The shape of the embankment could have been, however, more conical, and therefore the height even greater.

A large landscape depression has been observed, even since the 1990s, immediately to the west of the Documaci mound (Figures 30/a; 58). It was also documented by aerial imagery and DSM analysis in our study of 2017 (Ștefan *et al.* 2017), and evaluated as a potential source for the soil used to heap the mound. The recently acquired LiDAR data (Figure 29), that allowed us a larger and more integrated perspective of the terrain features and archaeological anomalies of the Documaci hill, showed that the depression is not part of a larger silted ditch that could have encircled the mound, as at other cases of large Hellenistic mounds – Omurtag Mogila at Sboryanovo, Ygma Tepe at Pergamon, or the Dulcești mound close to ancient Callatis. The depression is localized on only one side of the Documaci mound, developed along an NNE-SSW axis, parallel with the main hilly ridge, over an area of *c.* 6,500 m^2. It has a maximum opening in the superior part of 133 m, and a maximum depth of 2.4 m calculated from the surrounding terrain to the north.[4] The bottom is not uniform. The gap is divided in the middle by a higher portion of the terrain, thus appearing to be made of two different sinkholes. Its eastern slope continues practically to the western slope of the mound, adding an extra height to the embankment, if seen from west, of 1.4 m to 3.5 m (calculated as the elevation difference from the *krepis* wall base, which is more or less 45.00 m absolute elevation – Black Sea reference).

The occurrence of the depression can be explained in two ways: either as the primary source for soil for the Documaci mound, shaped in this unusual manner because the terrain to the north and south of it could not be cut further (for example because of the road passing along the ridge); or as a karstic formation similar to the Blebea pit and Obanul Mare, both located not far away (Figure 33). The shape of its inferior part, split into two cavities, fits better with this second hypothesis. In the eventuality of this last case, the ancient builders, nevertheless, took advantage of its presence as a natural formation and raised the mound in its vicinity – to enhance its monumentality. Further geotechnical drillings may bring the needed clarifications.

Elements of stratigraphy and techniques applied in the embankment construction

Relevant data about the techniques employed by the ancient builders to heap and stabilize such a large embankment were documented in all the researched sectors, but especially in trench S1 (Figure 67, 71). This excavation, begun in 2017 and finalized in 2019, was opened perpendicular to the *dromos* in its 2nd sector, the one covered with the gable roof. It measured 20 m along an NNE-SSW axis, defined by the modern concrete door which closes that part of the corridor, preserved in complete elevation. Several characteristic elements were documented here: the building of a levelled overall foundation with brought in and well-beaten clay (Figure 141), the heaping of the large mound out of several smaller construction nuclei (Figures 68/a-b; 69/a; 71/a), and the reinforcement of these nuclei with fragments of short and low dry-stone walls with

[4] The initially reported difference of 4 m was calculated in relation to the preserved margin of the mound.

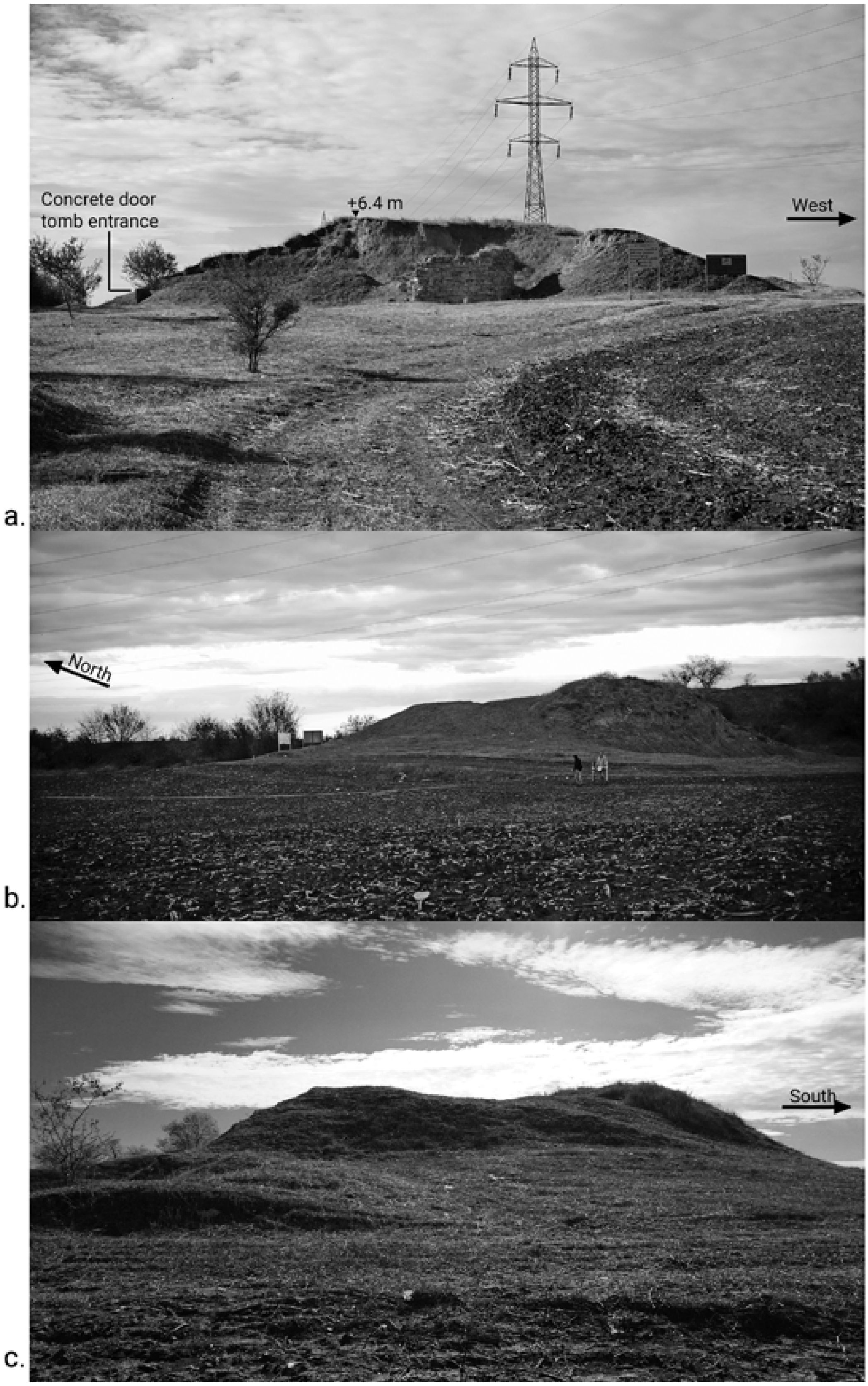

Figure 56. General views of the surviving sector of the mound (2017), before the start of the new excavations.

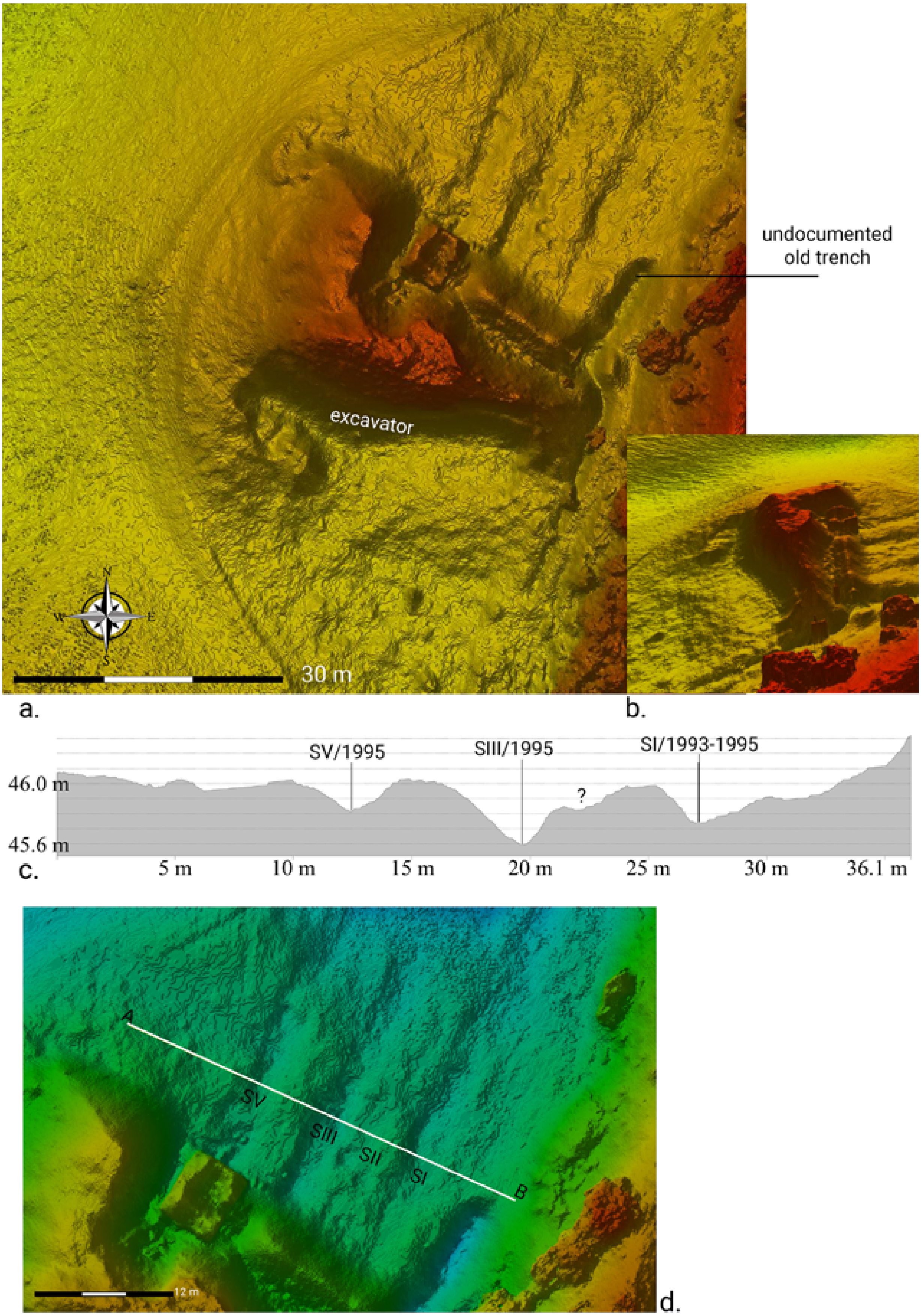

Figure 57. a) Digital elevation model of the terrain surface obtained with photogrammetric methods applied to aerial images recorded with UAVs. The microrelief thus revealed allowed the identification of the layout of former trenches; b) view from east; c) AB altimetric profile calculated on d.

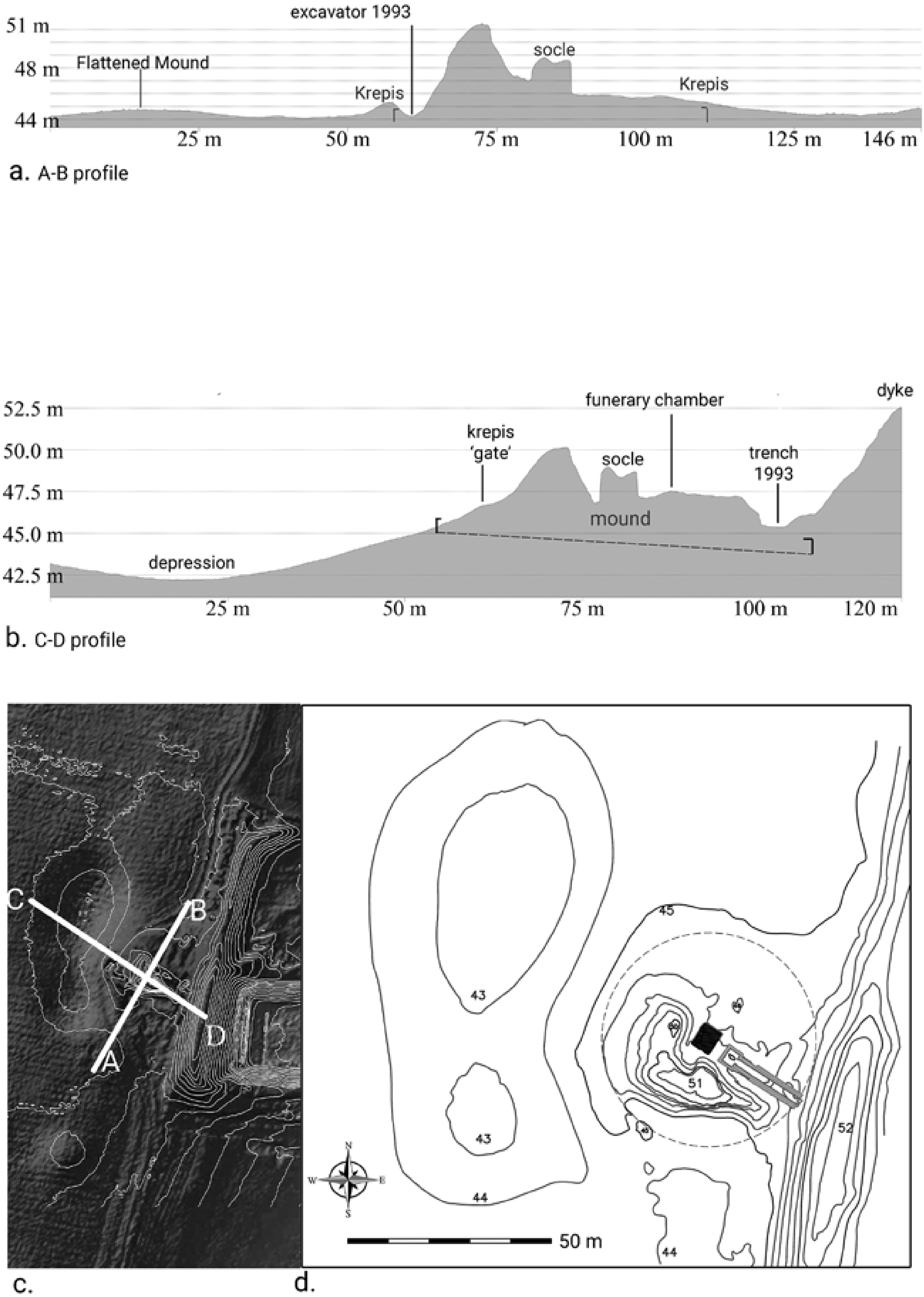

Figure 58. General altimetric profiles on the relief calculated with photogrammetry applied on aerial images recorded with UAVs.

Figure 59. General plan of the mound with all its composing elements, integrating data from multiple sources: aerial images, geophysics, new excavations, and older plans.

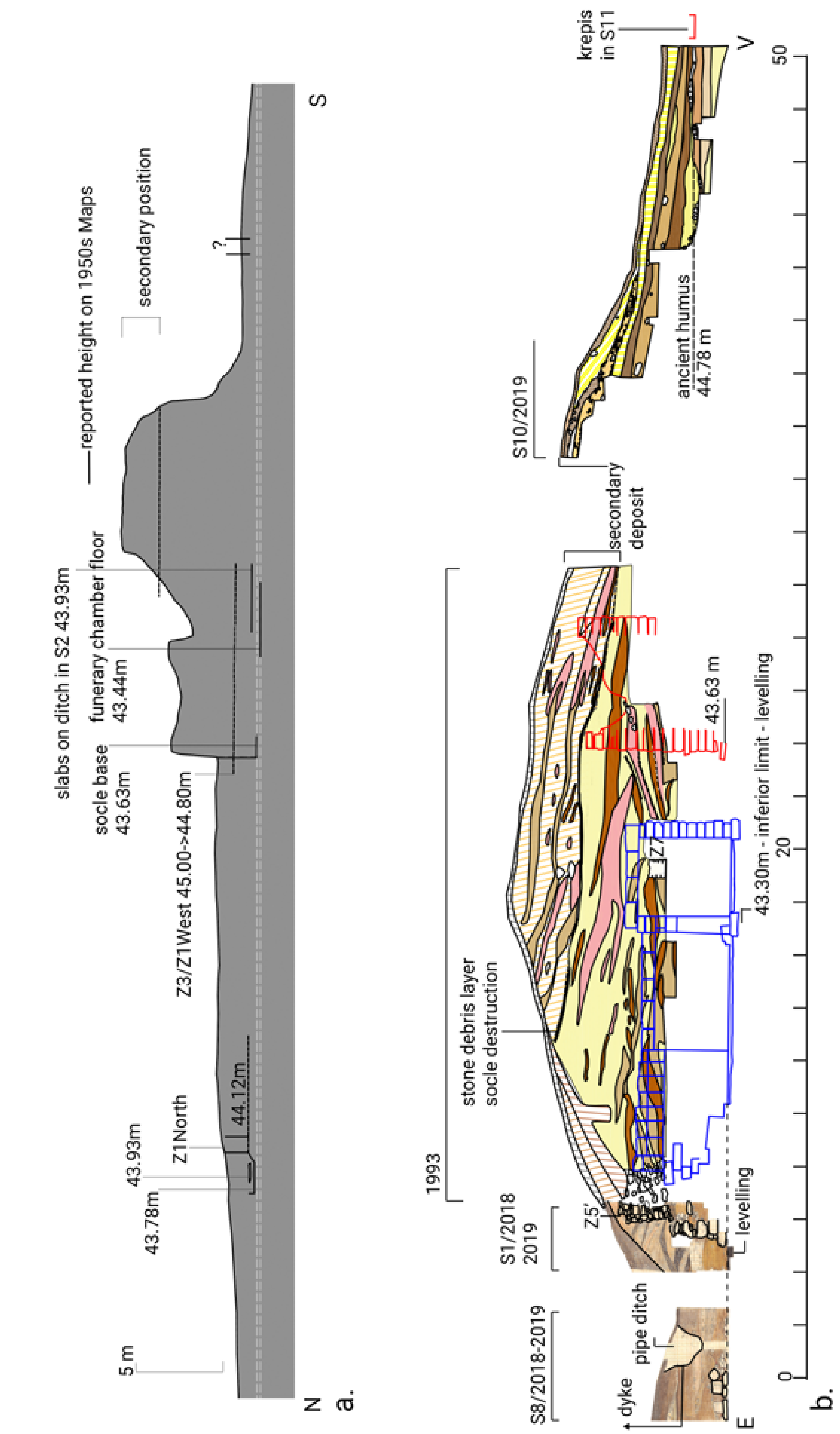

Figure 60. Stratigraphic and absolute elevation references. Integrating data from multiple sources, from various parallel plans.

slanting bases (Figures 68/d-e; 71/d-e). Here also in S1 we found clues attesting the excavation of foundation trenches for the walls of *dromos* II in a previously heaped embankment, including in the initial levelling (Figures 71/d; 140; 142; 147/d). This anteriority did not necessary imply a lengthy interval, as in different tomb building phases, but could be just related to the order of construction activities.

The existence of an initial layer laid down as foundation for the mound: this layer was dark-brown clay, very clean and without archaeological pigments, well beaten, with a very compact texture. Its upper limit was straight, sharply defined. Its lower limit blended into the soil underneath, which had a comparable nature. Two very small, atypical fragments of a coarse fabric hand-made pottery of a local tradition, were found in this levelling layer. The absolute elevation value for the upper level in S1 was 43.78-43.84 m, i.e. 32 cm lower than in S3, 1 m lower than in S2, and 1.10 m lower than in S5 and S11. The aspect of this layer was, nevertheless, identical in all the researched sectors of the mound, including under the plinths of the funerary chamber walls, at 43.22 m, and 58 cm lower than in S1 (Figure 109/a). This uniformity is the main argument that favours a contemporaneity between the tomb and *krepis*, on the known diameter. The 58-60 cm level difference between the funerary chamber and *dromos* in S1 represents the thickness of the levelling layer at the eastern part of the mound. At the same time, the upper level of layer zero in S1 is almost identical with the bottom of the exterior pavement ditches in S2 and S3, and also with the walking level on the entrance pavement in *dromos* II. We interpret these values as indications that: a) the terrain had a natural slope from north and west towards east, with a difference of *c.* 2 m; b) the ancient builders cut the vegetal layer in the northern and western areas and filled a little the eastern sector of the terrain, reducing from this elevation difference, but not eliminating it completely; c) the zero-layer main function was that of foundation for the embankment, exhibiting a height variation of up to 1.2 m. However, the soil scraping, made before the zero layer was added, respected a unitary levelling system and precise enough measurements – the entrance in the *dromos* and the slab pavement fitted in the exterior ditch had been laid at very close levels: 43.80-43.78 m.

In the eastern sector, the large mound was assembled out of smaller heaps of earth built separately on either side of *dromos* II, interlinked with it through reinforcement walls. Individual nuclei were developed into small constituent mounds, built as a succession of layers of soils of various colours and textures (Figures 68/d-e; 69/a; 71/a). At the base of these constituent mounds the layers were thicker (40 to 60 cm), while in elevation they became thinner, from 20 cm to only 2-3 cm. Their alternating accumulation was the main rule, probably for enhancing adherence: dark-brown soil, yellow soil, grey soil. All the layers were intentionally compacted. Two such monticules were identified in S1, one on each side of *dromos* II, and both cut in various amounts in their upper part by modern destructive activities. In comparison with the embankment adjacent to the funerary chamber and *dromos* I, where the layers arose inclined towards the walls (proving a simultaneous and gradual heaping with the stone masonry work, Figure 61), the layers on both sides of *dromos* II were descending towards the built *dromos* II walls.

The northern nucleus, preserved only to a height segment of just 2-2.20 m, had its centre 5 m from the margin of the ditch in which the *dromos* II north wall was placed (7.25 m north from the corridor central axis) (Figure 68/b). The first added layer of this nucleus (yellow clay) covered a radius of 1.3 m, but after successive heaping the monticule measured at least 10 m in diameter (an 11 m in diameter monticule would have occupied the space delimited in that sector by a *krepis* with a 52.8 m diameter, as discussed previously). The new layers were added on top of the older ones, starting from the base and respecting the same point of summit, consequently the overall curve described by the layers was of a dome. The space between the monticule and the *dromos* was filled with stones. The stones constituted mainly the fill of a ditch excavated in the monticule base for the northern wall of *dromos* II. The larger dressed stones (70 cm wide) of the *dromos* were positioned facing the corridor interior, while the rest of the ditch width was filled with rubble and stones of various sizes (Figures 71/d-e; 137; 138/a-b; 141/a). The ditch for the northern wall had a width of *c.* 1.30 m and a depth of 40 cm, cutting two previously built layers of the monticule, while in the southern wall it was observed at a width of 1.20 m and 90 cm depth, cutting at least one thick layer laid at the base of the southern monticule, and also the initial layer zero levelling. Both trenches have a slightly rounded bottom filled with yellow clay. We know that there were two distinct excavations and not just one large pit, because their inner margins, outlined in yellow in the initial levelling with brown clay, were clearly visible in S8 in the dismantled sector of the corridor (Figure 147/d).

In the researched sector S1, the stones filling the foundation ditches for the corridor walls were continued towards their exterior, above the monticules, on both sides, with short dry-stone walls. Z6 (Figures 67-71), built outside the northern *dromos* wall, measured *c.* 2 m in length, 80 cm in width, with a preserved height of a maximum of 1.20 m (seven rows of stones). The sloping base of this wall suggests it was used as both a reinforcement for the *dromos* wall and as a filling of a gap formed between an already heaped monticule and the *dromos* wall. In its superior part it was continued on all sides with a pavement. The arrangement of these slabs along a symmetric curved profile with the layers of soil further north in S1, suggests the slabs were fit in place as just another layer of the monticule, sealing the wall Z6 inside the soil structure. Even if from this elevation up the embankment was destroyed, a stratigraphic hypothesis regarding the missing part is offered by the rest of the layers documented further north in S1, which, if continued along their slopes, would have covered the pavement, making it part of the same monticule. All these layers were built from level zero up. Thus, we take this as an indication that the monticule and *dromos* II were built during the same phase, but in a succession of operations: an initial heaping, then the excavation of ditches in the periphery of the little mounds, then the adding of support walls with slanting bases once the *dromos* walls were raised, and finally the completing of the monticules with layers of soil.

The southern monticule survived to a maximum height of 4.10 m. Its base was also assembled of a chunky layer of light-brown loess (1.20 m thick), observed 3.40 m S-N along the trench profile (Figure 71/d). Again, a diameter of 11 m fitted well with the deduced outline of the *krepis* (ideal circle). An alternation of contrasting coloured soil layers, measuring between 40 and 5 cm thick, were interlaced with two dry-stone walls (Z5 and Z5') with sloping bases. A layer of stone debris marked the excavation level for the foundation ditch, indicating that the first four rows of stones for the southern wall of *dromos* II were laid as a group, followed afterwards by a heaping of the southern monticule with soil, before adding the rest of the *dromos* wall. Scattered stones and fine limestone debris layers cover the southern monticule up to 1.5 m from the *dromos* wall on its exterior, marking the area where the stones for the *dromos* and lateral walls were fitted in their places. Z5, which was badly destroyed during 1993 activities, was visible only on its eastern face, and mostly just on its base. It was connected with the back stone-filling of the *dromos* II southern wall. It measured 3.40 m in length and a variable preserved height, with a maximum 1 m (four rows) at its southern end. A height difference of 1.2 m can be registered between the two ends of the Z5 base. Z5 and Z6 were aligned to the same SSW-NNE axis (Figures 69/d-e; 70/e). The length of the support walls, their intersection with the walls of *dromos* II (with their backfilling, more precisely), and the symmetrical disposition and diameters of the two monticules on the two sides of the *dromos*, indicate that the entire eastern sector of the mound, along at least the 20 m investigated in S1, was built on one occasion. Despite the fact that the *dromos* II walls were clearly fitted in ditches dug in previously laid deposits, the rest of the stratigraphic evidence does not sustain the hypothesis of a second construction phase of the *dromos* and, respectively, the mound.

Chronology of the embankment heaping in its eastern sector: several archaeological materials were found in these deposits related to the heaping of the two monticules during the building of the support walls Z6 and Z5 and of the *dromos* II walls. Shards of amphorae walls, covered in whitish engobe and bearing traces of secondary firing on their surfaces, were found in two groups, one underneath the eastern margin of the slab pavement topping Z6 (45.10 m, S1/sq. 6), and the other right underneath the stone debris layer marking the settling in place of the base for the southern *dromos* wall (44.90 m, S1/sq. 8). These shards could belong to the same vessel; the presence of charcoal in both find contexts and the close deposition elevation values allows this possibility. A bottom of a fractionary amphora (cat. A 1), also covered with whitish engobe, possibly Chersonesus, end of the 4th-middle 3rd c. BC (45.46 m, S1/sq. 9), was also found in the soil layers heaped during the building of the southern wall of *dromos* II, but before Z5 was added. A fragment of a pitcher was found linked to the western side of Z6 (S1/ sq. 5, 45.04 m), in the layer of yellow loess which supported it (beneath the stone pavement). Almost two thirds of a large *lekanis* with inturned rim (cat. E 2) were found, covered in brownish glaze only on the inside and bearing traces of lead repairs, in the upper part of the southern monticule, under Z5 (S1/sq. 10, 46.20 m). This type of treatment of vessel surfaces was attested at the Apollonia necropolis, starting from the end of the third quarter of the 4th c. BC (Damyanov 2017: 91). Some good analogies also come from Apollonia Pontica, dated to the second half of the 4th - beginning of the 3rd c. BC, while at Albești they range along the entire 3rd c. BC (Buzoianu, Bărbulescu 2008: cat. 123-128). Finally, a partially broken bronze arrowhead, with three blades of a later type, was found at the bottom of the foundation ditch for the northern wall of *dromos* II (S1/sq. 6, 43.56 m). These materials do not sustain a narrower chronology, but a general placing after the end of the 4th c. BC, and probably before the middle of the 3rd c. BC.

Additional fragments of early Hellenistic vessels originate from the dismantling layer of *dromos* II, found in association with Late Roman ware, in S8: two fragments of *lekanides* with profiled rim worked in very fine red fabric (cat E 1), a fragment of a Sinope amphora (cat. A 3) and a Thasos amphora toe (A 4). These materials suggest a date in the late 4th - first quarter of the 3rd c. BC. Their find contexts may imply that originally they could have belonged either to the funerary inventory laid inside the tomb and scattered during looting, or, more probably, to the embankment adjacent to the dismantled walls of *dromos* II, in a similar position to the materials presented above in connection with Z6 and Z5.

Modern-era interventions: S1 cut only a small portion of the main E-W profile documented also by M. Ionescu in 1993 (Figure 60/b); it helped, however, in establishing clearly that the latest three oblique layers that abruptly cover Z5 and the southern monticule were of modern date, perhaps related to the construction site of the military dyke (as we know it happened before 1993). Their loose texture, the blurred limits between the deposits, the different orientation and larger thickness of the soil layers, were in obvious contrast with the heaped and well beaten, clearly delimited layers underneath. Our excavation had also identified modern materials (nails) inside the lowest of them. In S1, quarter 10, the maximum preserved thickness of this layer in its secondary position was 1.20 m (Figure 142). In the eastern profile of S1 (C10/sq. 8), a thin (5-7 cm) horizontal sheet of very fine reddish limestone dust marked the inferior part of this deposit (45.84-45.87 m), suggesting that the destructive event could had been associated also with a dismantling of stone structures, perhaps of the socle (which was built of reddish limestone blocks).

The study of the main east-west profile[5] of the mound, parallel with the tomb axis, corroborated with the *dromos*, *tomb* and socle main section,[6] reveals no firm indication for a construction in two phases corresponding to the two different building styles of the *dromos* sectors, nor of a secondary intervention related to a subsequent adding of the socle (Figure 63). What can we observe instead, by analysing the drawing in the light of our own measurements and excavations, are that the excavation of the 1993 profile did not reach the zero-level of the ancient mound construction; and the profile stood several metres (3.20/4.50 m) behind the built structures (to their south), therefore some stratigraphic indications could be only partially relevant for the masonry structures.

Lack of conclusive stratigraphic data for a dromos built in two phases: at least one more construction nucleus of the embankment can be observed west of Z5, built as a succession of contrasting layers with a dome-like profile. Its diameter corresponds to the entire length of the two segments of the access corridor taken together, suggesting the construction of the entire area of the embankment was adjoined south of the *dromos* during a single moment.

The embankment above the tomb: the way the embankment layers were organized, as depicted in the profile from 1993, allows a partition of the mound in three sectors along its height – the lowest one, rising just to the top of the chamber tomb, was built from numerous layers with rather reduced widths, and a dome-like outline (a monticule); the second sector (2 in Figure 63) was represented by a thick deposit of yellow loess, measuring up to 2.5 m in thickness and at least 9 m in length, added right above both *dromos* sectors, to the west of the Z5 wall and above the construction nucleus which incorporated the tomb (there is no indication in the old drawing for a cut at this level); in the same middle sector of the mound we include a second layer, of reddish loess, 80 cm thick, obliquely laid along 10 m, covering both the yellow layer just described and the funerary chamber. This middle segment of the embankment is clearly differently built than what was laid beneath. If the tomb and *dromos* were supported by lateral soil ramparts, built as a succession of layers at the same time as the masonry work, after the tomb was finished, its covering was assembled as a uniform deposit – thicker and larger.

The upper (third) segment of the embankment (3 in Figure 63), measuring an average of 2.5 m in thickness, was marked in its inferior level by a thin and continuous (about 16 m long) layer of limestone debris corresponding in elevation with the maximum preserved height of the socle. Taking into consideration the information we obtained in S10, in the western mound sector, we may presume that these upper layers of soil are most certainly in secondary position and related to a huge operation of dismantling the socle which might have happened before the 20th century.

Recovering stratigraphic documentation: Relevant stratigraphic clues were extracted, after sustained effort, out of the six profiles drawn in 1995 by M. Ionescu, available for only three of the four trenches excavated, beginning with the 1993 work of V. Georgescu to the north of the tomb and socle (SII, SIII and SV - Figure 62). For the fourth and most eastern one (SI), the only source, albeit minimal, remains the general plan of A. Sion (probably created in 1994, but printed in 1999). A fifth trench was observable further to the east on the DSM, for which there is absolutely no documentation at all (Figure 57). Along its outline we opened S1, in 2017. The recovering of stratigraphic documentation out of the six previously mentioned section drawings was a difficult process. The quality of the source material was the first substantial obstacle – as the profiles have reached us only as photographs (oblique and partial blurred) of the originals. Almost a third of all the writing is illegible. The photographs recorded the drawings as parts which needed correlation. In addition, even since their drawing in the field, the length of the profiles was divided into segments to fit on one sheet. Furthermore, the lack of context data available for these materials initially made it almost impossible to

[5] Documented by M. Ionescu in 1993 and exhibited in printed format in the Callatis Museum.
[6] Drawn by A. Sion, and then digitized, completed with new data and referenced with Ionescu's profile by the present authors.

Table 4 Names and documentation available for the old trenches of V. Georgescu.

A. Sion-pl II	A. Sion-pl. III	M. Ionescu	Photos 1993
S I/1994	SII/1994	S2/1995	yes
SII/1994		S1/1995	yes
SV/1994		S4/1994	no
no		S3/1995	no
no		S5/1995	no

establish which trenches the drawings referred to, or if they represented partial or complete documentations, not to mention that, until a proper excavation plan was recovered, it was unclear where in the field the sections were located exactly.

Using the results of the geophysical survey (Figure 9) and the study of the micro-relief on the digital elevation surface model obtained from UAV (Figure 57), to which secondary information was taken into account, i.e. A. Sion's plan and the few photographs made on site by Georgescu's team and by T. Bănică (in 1993, Figures 64; 131/b), we consider we have managed to establish with a high degree of confidence the plan of the old excavations and also the chronology of their research. Our own excavations, in S3 and S1, partially intersecting this sector, and the analysis of the ensemble of elevation values, allowed us also an approximation of the excavations' depths, attempting a correlation of the 1995 drawings with the general deduced levelling of the monument.

The six available section drawings of M. Ionescu discussed here (Figures 62; 81) contained just plain contours and no legends. The only metadata offered concerns the colour of the deposits (the limits of which, however, were not always clearly delimited) which was written as a label directly on the drawing. The references to these colours were not always very consistent: for example, brown-yellow or yellow-brown, or brown with yellow pigments can be all the same, or three different things altogether. During digitisation we tried to remain coherent, as much as possible, always comparing the sections for both walls of the same trench, using the same colours for repeatedly given labels, while analysing the logic of the layers and cuts. More important than a standardized colour matching (almost impossible) seemed for us the idea that layers were perceived as different. In cases, not many, we were the ones to establish drawing limits for some of the layers so as to be able to obtain, in AutoCAD, the coloured filled hatch blocks. We consider, therefore, that this stratigraphic documentation, as it stands now (i.e. digitised) contains some degree of approximation, and reflects mainly our own interpretations, taking all the elements previously stated, but that is remains, nevertheless, relevant.

The main stratigraphic information obtained as a result of the recovering process of the older documentation discloses the construction of the mound to have been a single event, but carried on in sectors built separately from the ground up, each treated distinctly according to their relations with the built masonry structures contained. The three documented trenches are relevant specifically for the northern areas around the socle (SV, Figure 81), funerary chamber (SIII) and *dromos* I (in SII) (Figure 62). In addition, all the six profiles revealed the large extent of the secondary interventions affecting the northern periphery of the mound, the latest one to be dated in the modern period, before 1993, while another one, if not two other interventions, seemed even older, perhaps from late antiquity (?). Except for the identification by Ionescu of certain layers as representing 'modern slag', there was little direct reference to secondary interventions made on the 1995 drawings. We decided, nevertheless, to represent as unsolid hatched identifiers all those areas which, taking into consideration the outline of the layers, seemed to have been, at some point, cut in the mound's structure. The levels of these interventions can be traced, if we take into account the few pits perforating the embankment and also the traces indicating the dismantling of the superior parts of the walls (both *krepis* and reinforcement walls). Two pits were identified in SII and SIII, and a ditch in SII (possibly the same in SI, according to A. Sion's plan). In SIII, the deposit, which can be considered later than the mound, measured as much as 1.50 m in thickness.

In trench SV-1995, excavated perpendicularly on the northern side of the socle, we can observe that there is no sign of a secondary intervention in the embankment. The socle was built at the same time as the northern lateral soil support (Figure 81). This northern segment of the mound was assembled near the socle as a succession of thin and oblique layers of various colours, built from the base up, one on top of another, rising towards the socle, exactly like a 'bastion'/buttress, not a dome-like monticule. The rampart developed on a 14.3

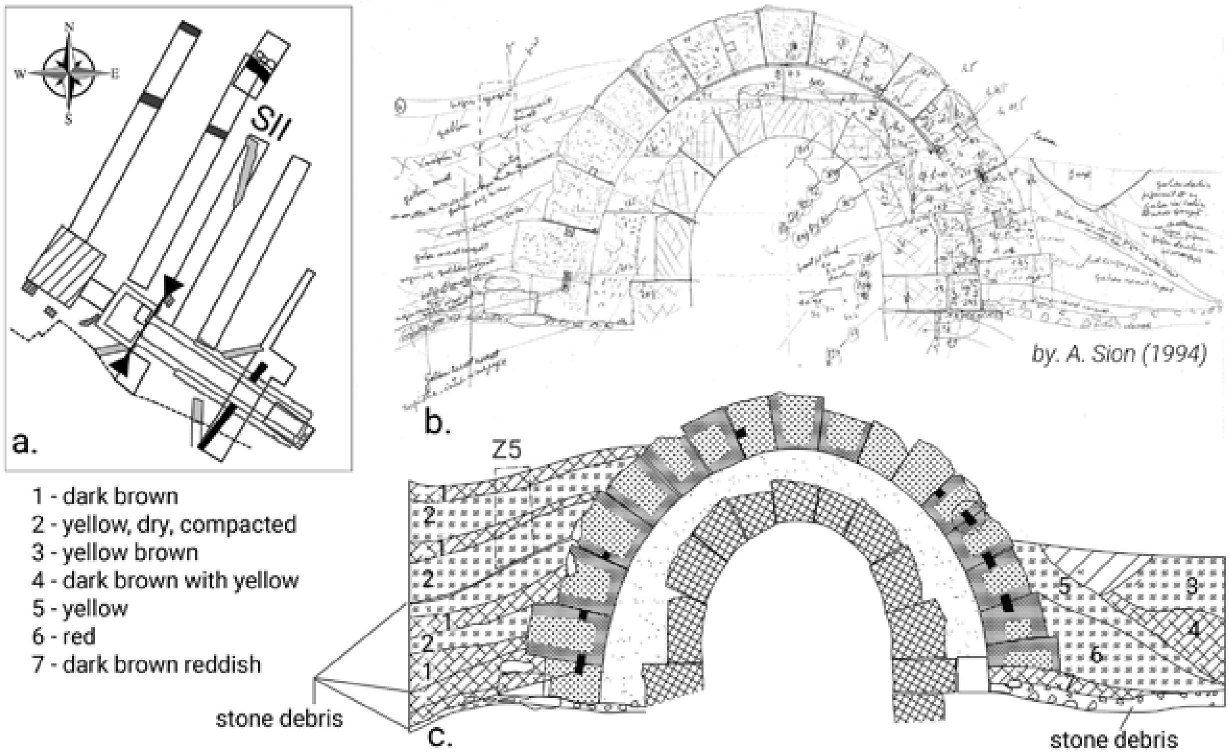

Figure 61. Digitisation of an unscaled field sketch by A. Sion, dated 1994, recording the building layers for the funerary chamber vault.

m width between the socle face and an intermediary reinforcement wall located to the north (see further, Z11). The building layers measure between 15 to 40 cm in width. A thin layer of stone debris, also containing several larger blocks, was documented intercalated between layers of soil, along the entire rampart width of 8 m on the eastern profile of SV, and 4 m only on the western profile. This is certainly a construction layer indicating that the soil rampart was raised once several stone rows of the socle were put in place, in a single construction phase, with blocks cut *in situ*. We tried to establish where exactly along the socle wall elevation the documented sector was. We used for that the precise measurements of the current terrain around the socle in absolute values in the area of the former trench margins, corelating them with the deduced absolute level for the socle base (which we did not excavate, but was retrieved based on A. Sion's general E-W section, taken in relation to the funerary chamber base which we actually measured). It seemed that the excavation of SV-1995 was interrupted 1 m before reaching the socle base.

The hardest to put together and interpret proved to be the documentation for SIII-1995 (Figure 62/a-b), a fact which was quite surprising considering that this old trench was the only one we actually reopened (S3/2017-2018, Figure 36), even if just along a small segment at its northern end. The stratigraphy here was more complex, and the data sources were preserved in poorer quality. SIII-1995 laid in the vicinity of the funerary chamber northern wall, apparently did not touch it. Knowing the exact position of the *krepis* wall from our own excavation, we anchored Ionescu's drawing from 1995 and established that the southern end of the trench stood *c.* 60 cm from the tomb (Figure 62/a-b). The analysis of the DSM revealed that SIII and SV were not exactly perpendicular on the tomb and socle (Figure 57). The stratigraphic data contained in SIII disclose, first of all, the way in which the tomb's structure was included in the embankment – again proving the simultaneous construction of the tomb with the surrounding embankment which was treated as a local nucleus, separated from the one surrounding the socle, for example. This simultaneity is proven by the existence of a series of stone debris layers originating from *in situ* stone cutting, intercalated between layers of beaten earth. Similarly to the socle area (seen in SV), the soil and construction debris layers were obliquely organized, raising towards the chamber as a buttress. The difference, in comparison with the embankment surrounding the northern side of the socle, resides in the higher number of construction layers observed in succession for the funerary chamber (three or more) and in the presence of a thick deposit of loess laid close to the base of the funerary chamber wall (maximum observed thickness – on the western trench profile – of 1 m, maximum documented width on the eastern profile of 8 m). This deposit could act at the same time as reinforcement for the wall and as waterproof

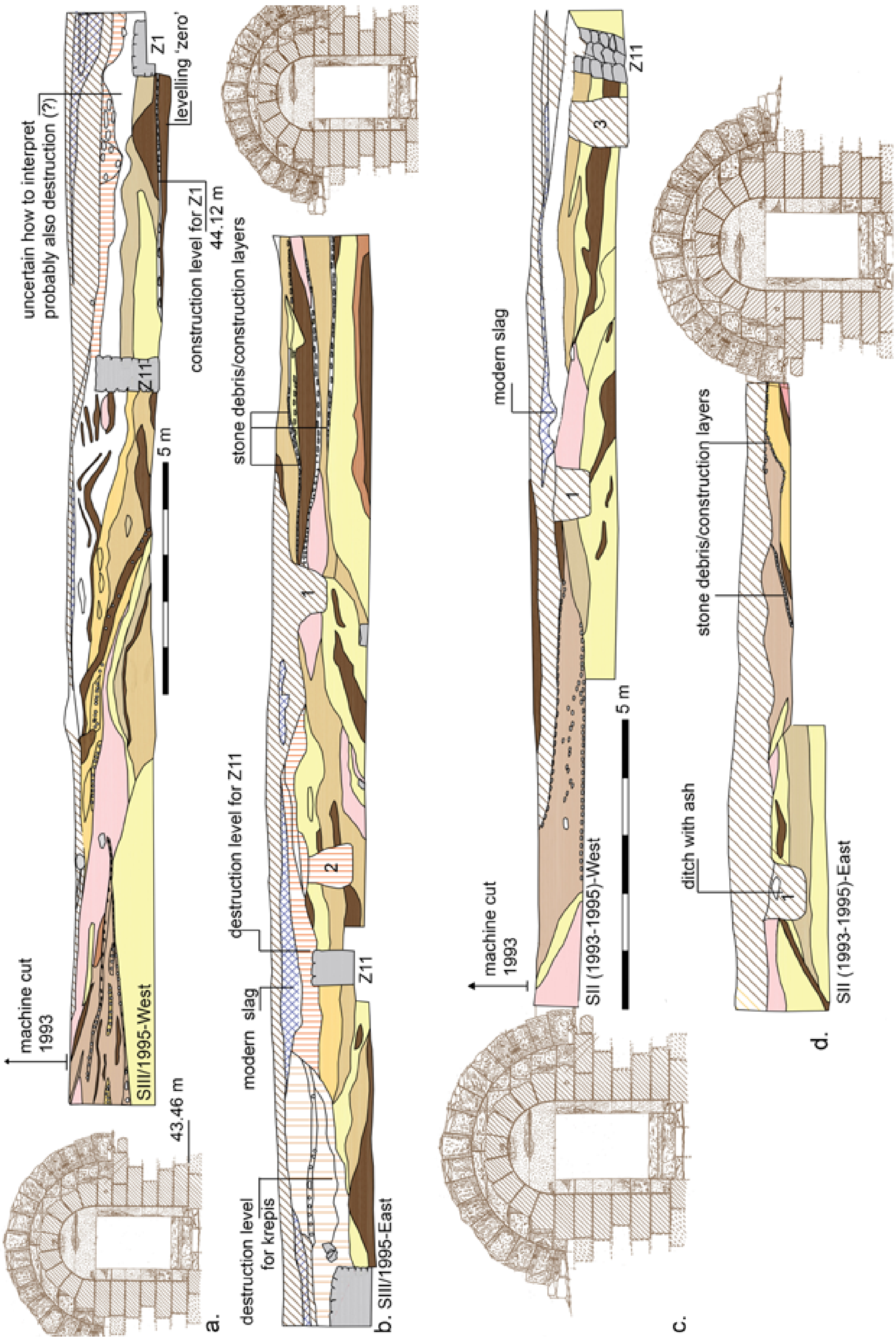

Figure 62. Digitisation, interpretation and spatial reference in relation to the tomb in M. Ionescu drawings (1995) of trenches SIII and SII.

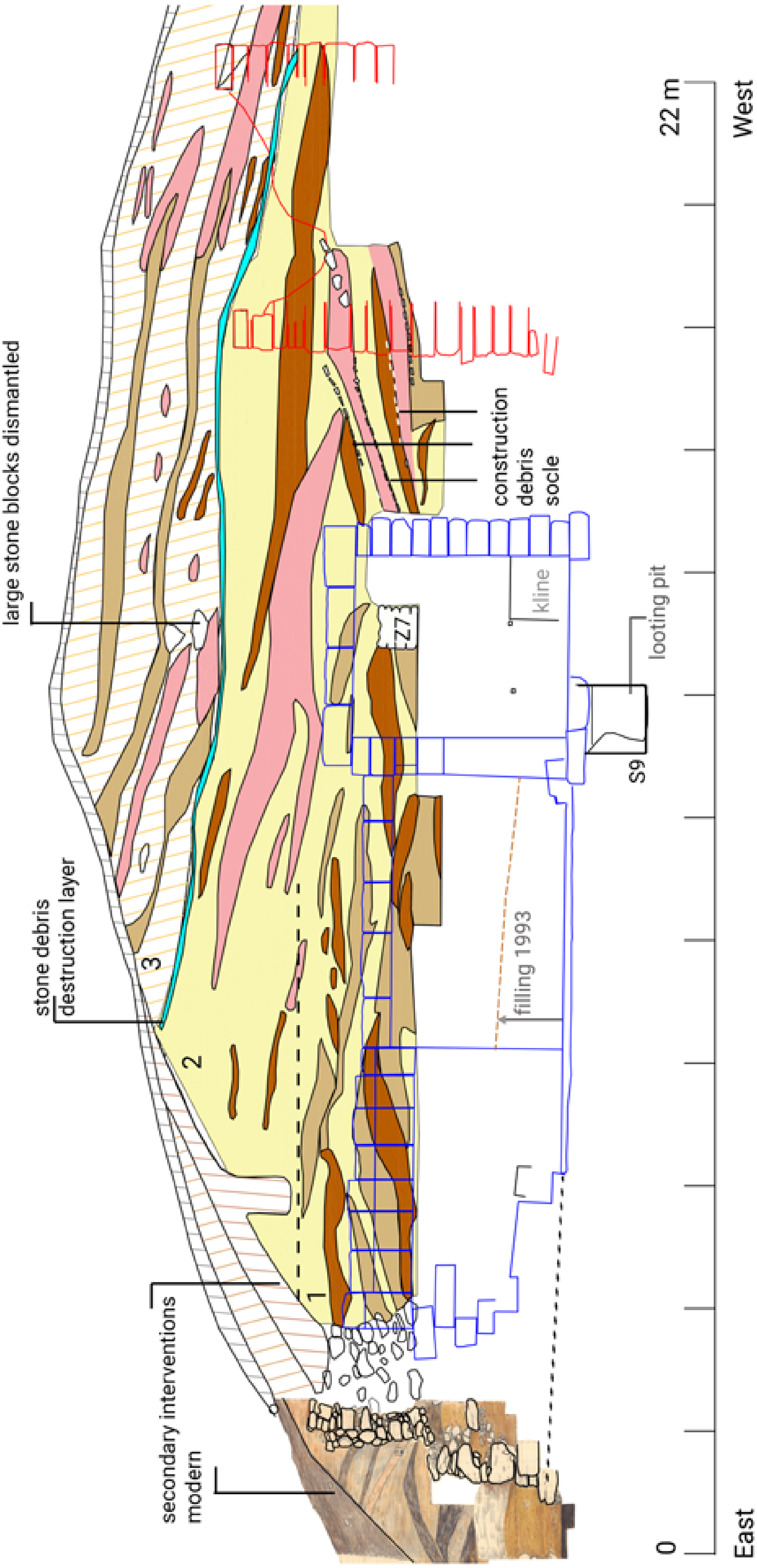

Figure 63. Composite section east-west, combining and interpreting stratigraphic and architectural data from several parallel plans. It includes data from M. Ionescu's and A. Sion's drawings and profiles from trench S1/2017-2019: 1-3) division of the embankment suggesting different heaping styles; the dashed line marks the interface between 1 (thin alternating layers, corresponding to the tomb); and 2) over the tomb with thicker layers.

insulation. Because the trench was not excavated until the zero level of the ancient construction, and because it did not touch the funerary chamber wall, we cannot say if this rampart was put together first and the chamber walls were fixed in it, or if it was added after the base of the funerary chamber was assembled. The presence of the construction layers coming from the masonry work can be observed in SIII along a maximum length of 7 m on the eastern trench profile. Taking into consideration the elevation correlation of their extent with the funerary chamber height, they can be associated with the masonry work of the vaults.

A valuable correlation could be established between the western profile of trench SIII-1995 (Figure 62/a-b) and the main east-west profile from 1993. In the 1993 profile (located to the south of the tomb, Figure 63) a long reddish deposit was drawn covering the funerary chamber vault. In the 1995 drawing we might be able to see, in fact, the lower part of the same layer, because if we prolonged it on an imaginary line it would indeed reach the vault, covering the layers of debris associated with its previous assembling. The presence of this layer sealing the funerary chamber of a large surface, which was built from the ground up, supports even more the construction of the tomb and surrounding embankment as a single event, revealing at the same time the construction strategy.

The integrity of the stone structure was reinforced by carefully supporting it from the sides with layers of beaten loess, raised as the masonry progressed.

In SII the excavation did not descend beyond 70-80 cm in the vicinity of *dromos* I, so the available stratigraphic documentation is scarce. Nevertheless, we can observe on the 1995 profile the same construction debris rising towards the *dromos* (Figure 62/c-d). A sketch by A. Sion (Figure 61), dated 1994, recently discovered, documents a section through the *dromos* I vault, which also contained stratigraphic references to the neighbouring trenches, including SII, on a 1.40/1.30 m long segment. It matches roughly with the profile of Ionescu, but suggests that these profiles, rendered at 1/25 scale, contained just the basic elements. Sion's sketch was much more detailed. She recorded six layers and a pit, whereas Ionescu had only three main layers and no pit (for the western trench profile). For the eastern profile Sion recorded 13 layers and M. Ionescu just five. The symmetrical trench located to the south of *dromos* I, in the continuation of SII, was described in Sion's sketch as containing as many as 13 thin layers, indicating that the surrounding embankment was systematically raised with every row of voussoirs, which increased the vault elevation. This careful assembling established a tight fit between the embankment and the built structure.

Reinforcement walls inside the embankment

One of the objectives of the new research was to clarify the meaning of the various segments of stone walls drawn by the architect Anișoara Sion and archaeologist Mihai Ionescu, in 1993 and 1995 (Figures 62; 63), around the tomb and socle, either closer to them or further away. Were they enclosing lateral annexes to the tomb's entrance? Were they remains of other funerary structures? The labels added with question marks near some of these representations, echoing in part the short excavation report by Georgescu, say 'ring wall' or 'grave' or 'secondary grave'. In total, the old documentation records clearly 11 such fragments of walls, linear, or in the shape of the capital letter 'L'. The L-shaped walls were considered possible graves, while other simpler linear segments were taken as indications for the existence of an initial smaller mound surrounded by a ring, afterwards incorporated in a larger embankment.

The geophysical investigation and the excavations made anew, during 2017-2019, helped greatly in clarifying their function and layout, discovering, as well, additional similar structures. Even if several categories can be identified among them (if one takes into consideration the variation in their building features), we interpret the main role of these walls, taken in general, as reinforcers of the embankment.

Seven such segments, measuring 65 cm or 75 cm in width and up to 3 m or 3.5 m in length, were represented by A. Sion, obliquely attached to the *dromos* and funerary chamber, on both sides of their walls, orientated in a partially symmetrical outline. We had the chance to redocument three of them (labelled by us as Z5, Z5'

Table 5 Categories of retaining/abutments walls built inside the embankment

Category	Features	Items
I	Slanting bases, set up on top of building earth nuclei; discovered only in connection with the tomb and the embankment area around it.	Z6, Z5, Z5', Z7, Z8
II	Flat bases, built on the same level as the *krepis*/right above the initial levelling, higher elevations; a characteristic outline based on right angles (rectangular enclosures, L shapes)	Z4, Z10, Z11-Z12-Z14, Z13

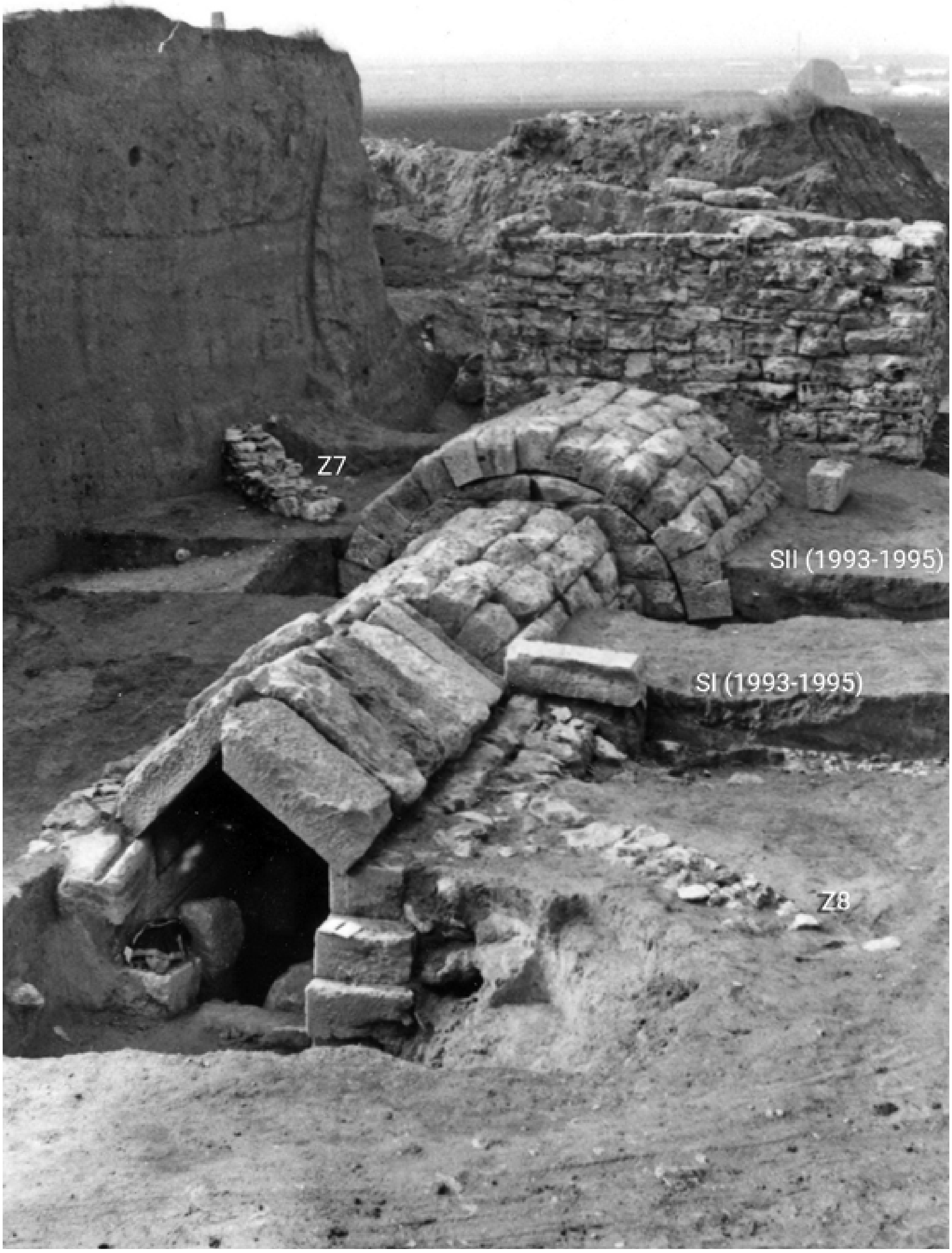

Figure 64. View of the tomb and socle from the east (a 1993 photo by T. Bănică).

and Z6, previously described) in trench S1(2017-2019). Based on the new research, we proposed their potential function as solid supports interlacing the building nuclei of the embankment with the *dromos* walls. The main features of this category of walls (cat. I) were the slanting bases set up above the curved earth monticules and their interconnection with the stones filling the foundation trenches for the *dromos* II walls.

Sion drew another two small agglomerations of stones (65 cm wide) to the south of the socle, about which we can say nothing, and two more L-shaped wall structures (one at 1 m west of the socle we labelled Z10, and the other we labelled Z12, at 13 m NE of the *dromos* I). Z10 was redocumented in S6 (2017) (Figures 48, 65), while Z12 was covered by the 1995 section drawing by M. Ionescu of trench SII/1995 (Figure 62). Other similar

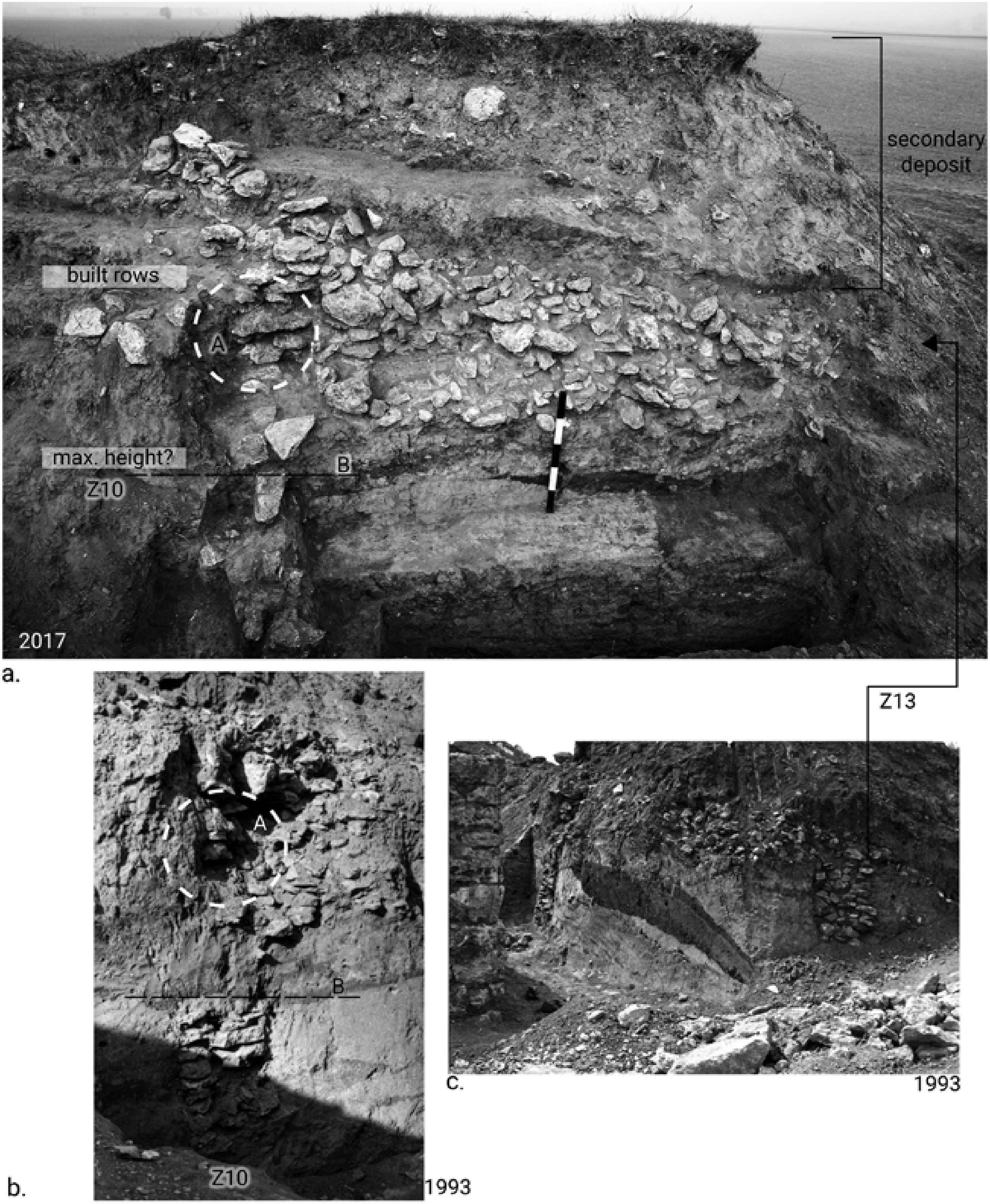

Figure 65. Stone embankments and retaining walls in the mantle sector preserved to the west of the socle: a) excavations in trench S6; b-c) archive photos by Georgescu's team in the 1990s.

walls were intersected by SIII/1995 (Z11) and SV/1995 (Z14). The revaluation of the older documentation corroborated with the geophysical survey allowed the observation that Z12, Z11 and Z14 were parts of the same structure which was built on the same level as the *krepis* wall (Z1) (Figures 9; 59).

Another wall (labelled by us Z13), only suggested on Sion's plan, where she described it as a 'ring wall', was recorded also in a 1993 black and white photograph, taken shortly after the excavator's destructive activities on site (Figure 65/b). The geophysical study (Figure 47) shows that this segment, badly destroyed by excavators, was in fact part of a larger rectangular enclosure, very probably also built on the same level as the *krepis*.

Following the ERT results, we investigated on the eastern side of trench S2 a wall (Z4) belonging to category II, described in Table 5. This research facilitated substantially our understanding of the older documentation available for such structures. Z4, orientated north-south, was built at the same time as the *krepis* wall, 4.70 m east of it. It was constructed inside the mound using an analogous construction technique – a dry stone wall, with stones arranged in rows (Figure 66). The two walls were not parallel. In comparison with the work done for the *krepis*, the stones assembled in Z4 seemed just to be boulders, only slightly cut to fit into place and piled in rows of various heights. The base of its western side stood on the initial levelling layer, while the eastern side was positioned 10 cm higher. The wall measured 71 cm wide in its upper part and 75 cm at its base, being preserved to a height of 2.30 m (15 stone rows). It was uncovered along a length of 3 m, while the ERT data indicated at least 7 m, with a possible continuation at a right angle towards the east.

Because there was no stone debris in the vicinity of the wall faces, higher in elevation only at the level of its base (along 1 m on both sides), we consider that the walls were built first completely in elevation, followed by adding the embankment layers in the space delimited by these walls. On the northern profile of S2 we documented three main layers of compacted loess, arranged with a slight inclination from Z4 to Z1, with the base of both Z1 and Z4 supported by a thick layer of yellow soil (1.15 m high near Z4). In the upper level of this filling there were two large blocks (from the socle dismantling?). The layers have less defined limits, but their texture is nevertheless compacted. To the east of Z4 the layers' orientation suggests the emergence of a construction nucleus. On both sides of Z4, at its base, several large slab blocks were randomly scattered on the construction level, either having fallen during the embankment heaping, or, most probably, just left over by the ancient builders, as unneeded material and covered with the embankment. A similar behaviour of the builders was observed in the case of Z9 in trench S11. Z4 unloaded part of the mound weight before it could press on the *krepis* wall, while also delimiting more concentrated areas in which the embankment could be built, in a zone-focused approach.

Low retaining fieldstone walls built under mounds to stabilize the heaped earth are documented in several cases in tumuli in Macedonia (Schmidt-Dounas 2016: 106, note 27): under the mound of the Derveni tomb G (Tzanavari 1996: 493), and at the Heroon tumulus at Archontiko, where the short retaining walls were observed starting at irregular intervals from the base of the dressed stone *krepis*, going obliquely towards the centre (Chrysostomou 1987).The Erotes tomb at Eretria, not in Macedonia, but with a Macedonian-type tomb and topped by a visible monument (Vollmöller 1901: 334), was reinforced at its higher strata by radially stacked fieldstones.

The Megali Toumba at Vergina, in particular, exhibited the most complex building approach (Figure 72) based on both low walls and a network of rectangular walled spaces filled with soil and rubble (Saatsoglou-Paliadeli 1984: 8-10; Drougou 2005: 15-2), very similar to what the ERT plot (Figure 9) and the excavations disclosed to have been under Documaci.

In Thrace, rubble walls adjacent to the chamber tombs were recorded at Sboryanovo (Fehrer 1935) and Muglizh (Archibald 1998: 293) and dated around the early 3rd c. BC.

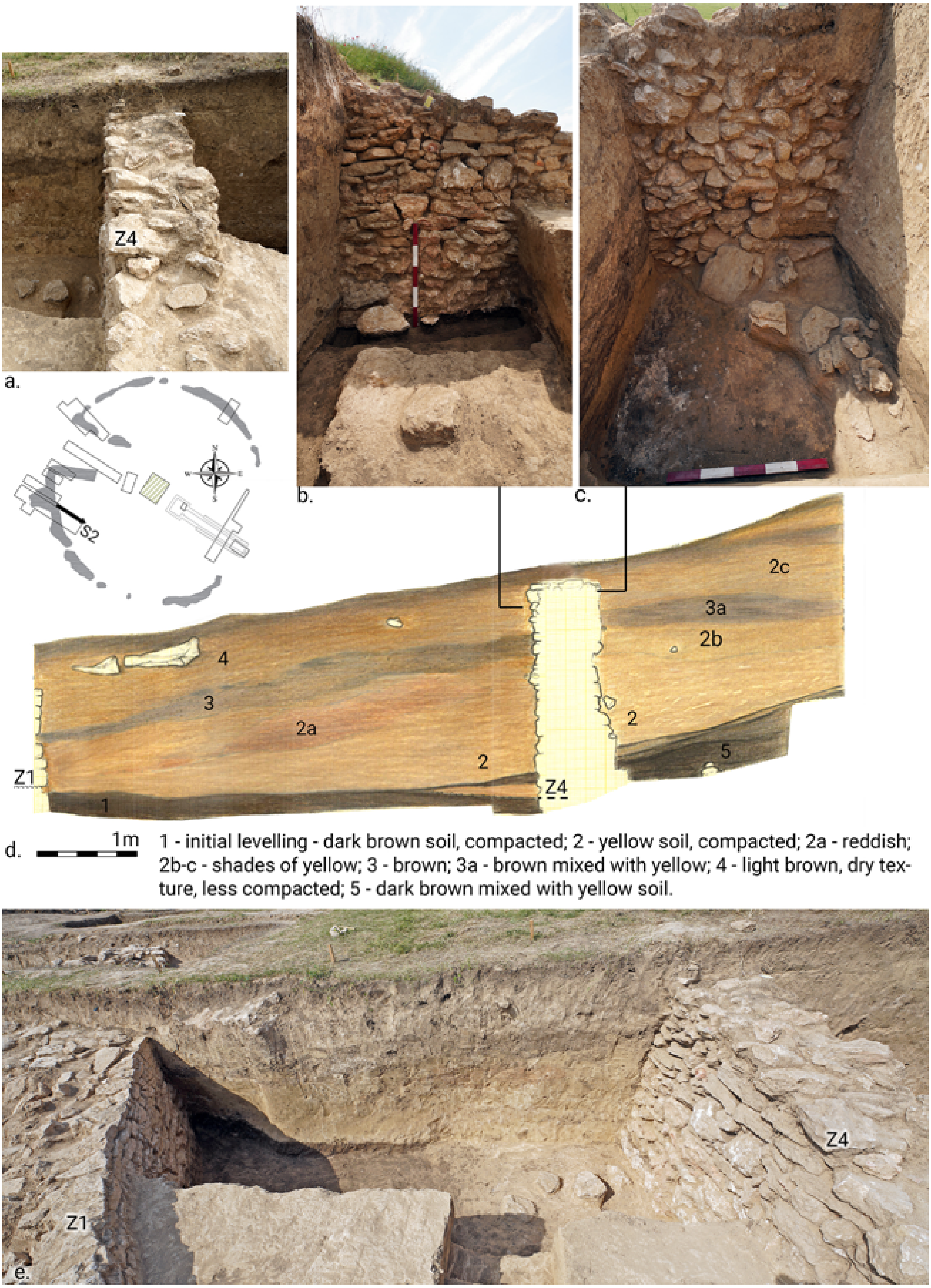

Figure 66. Retaining wall Z4 in S2, behind the *krepis*, in the western sector.

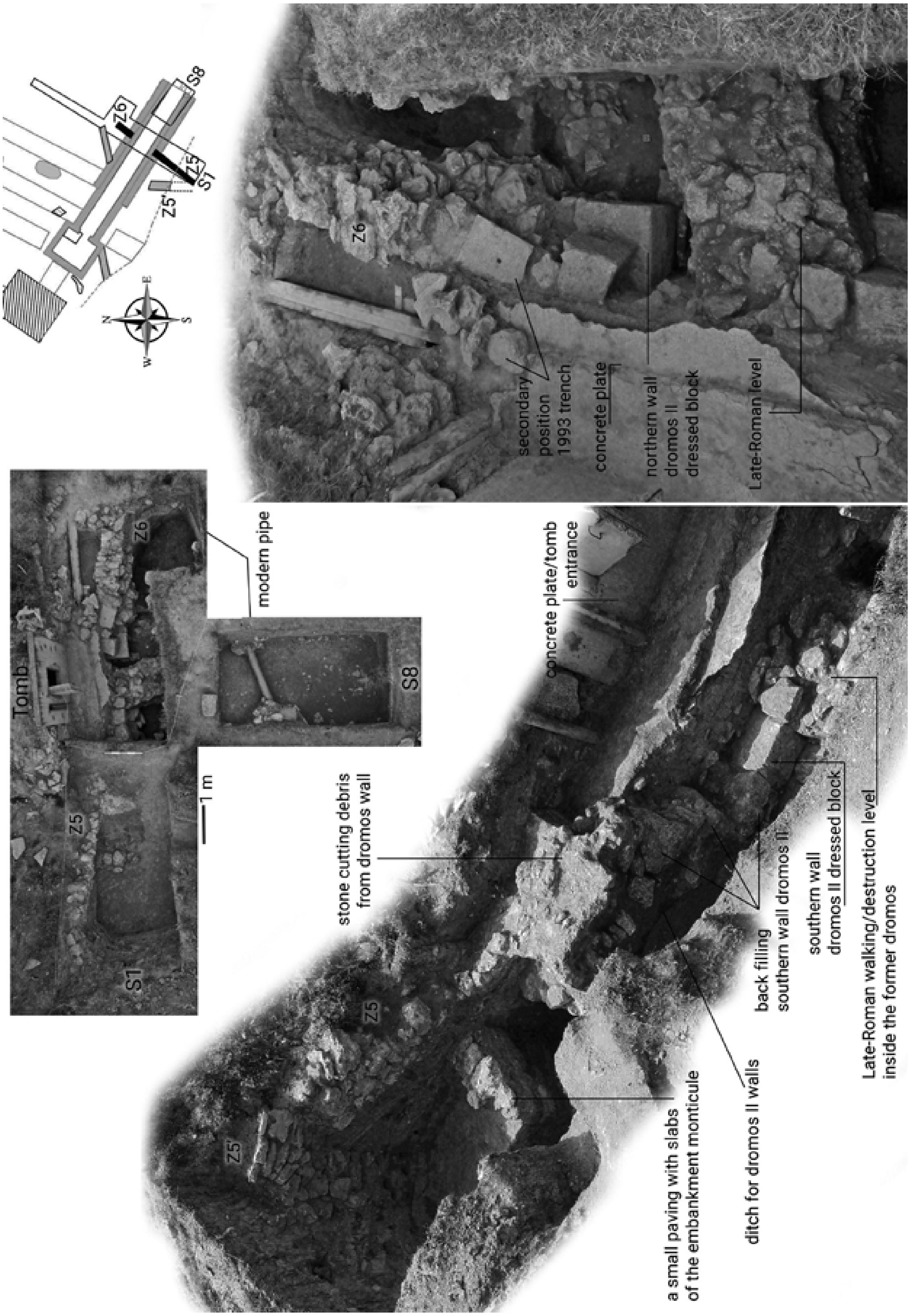

Figure 67. Excavations in S1, in the area of the dismantled *dromos II*.

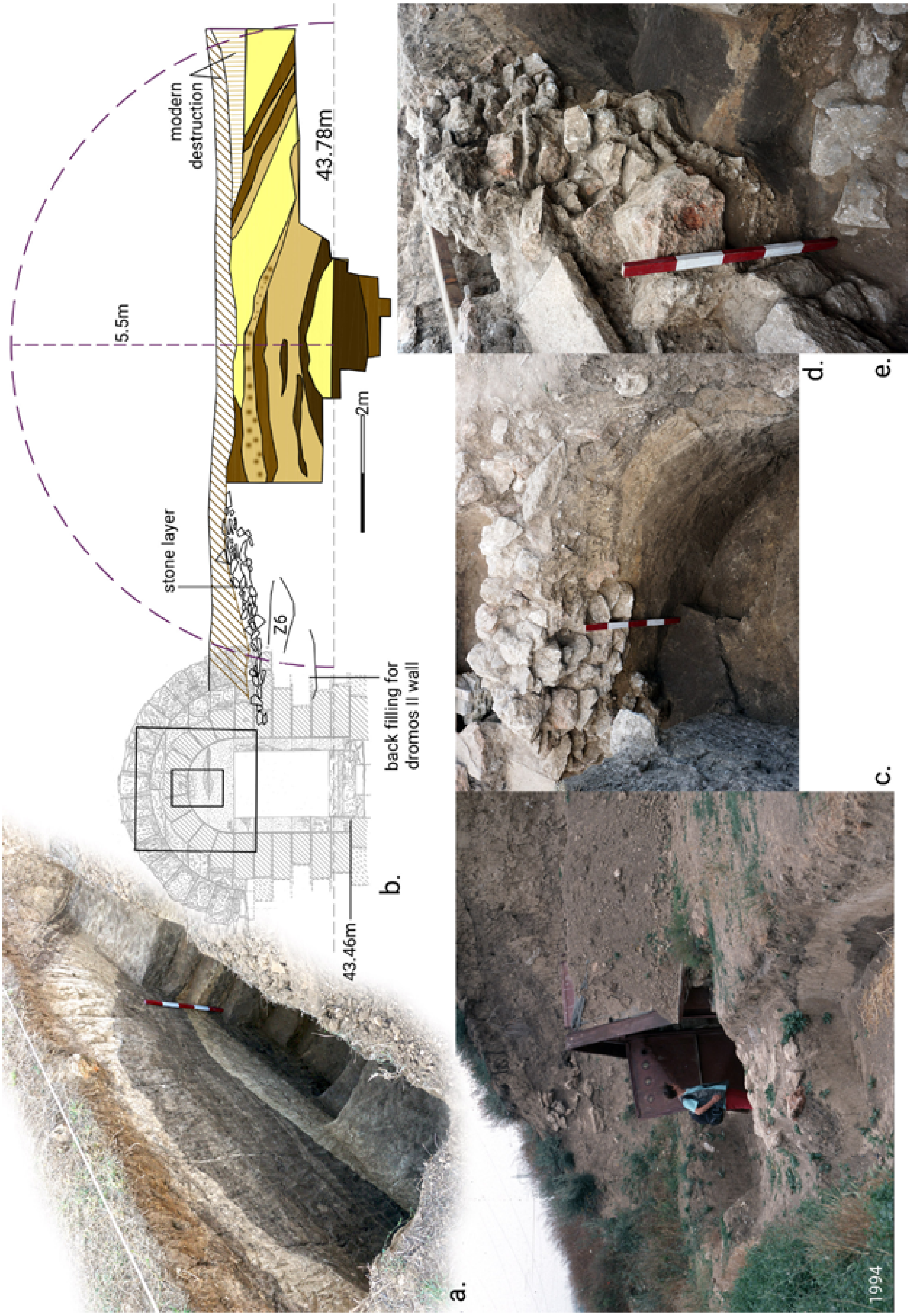

Figure 68. Elements of stratigraphy: a-b) construction monticule (north of *dromos* II, in S1); d-e) lateral retaining wall (Z6); c) image of the area recorded in 1994 by A. Barbet.

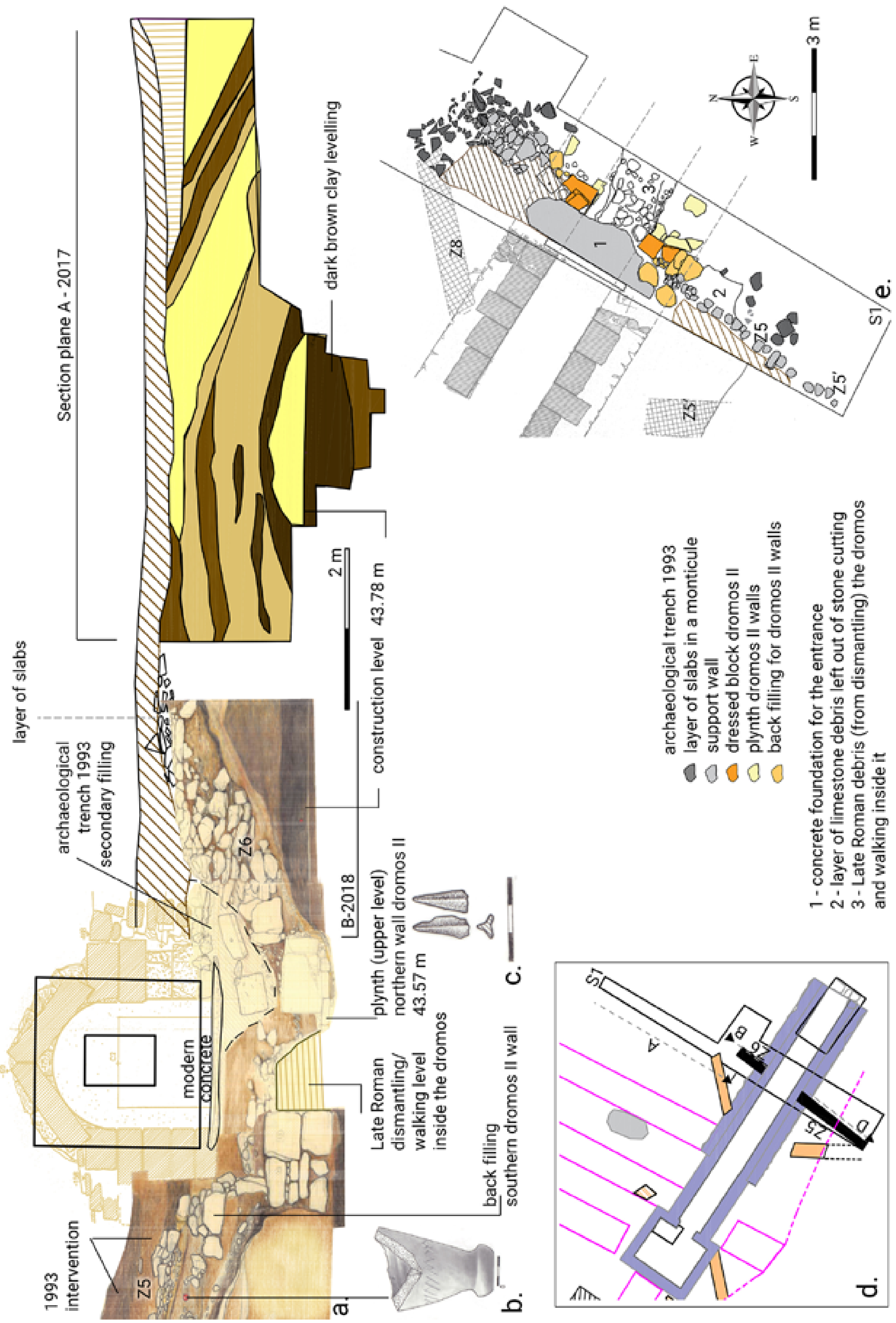

Figure 69. Stratigraphy perpendicular to *dromos II*, in trench S1.

Figure 70. Excavations in S1 in the area where *dromos II* was dismantled since antiquity and blocked with a concrete door. Details with Z6 – retaining wall supporting the northern wall of *dromos II*.

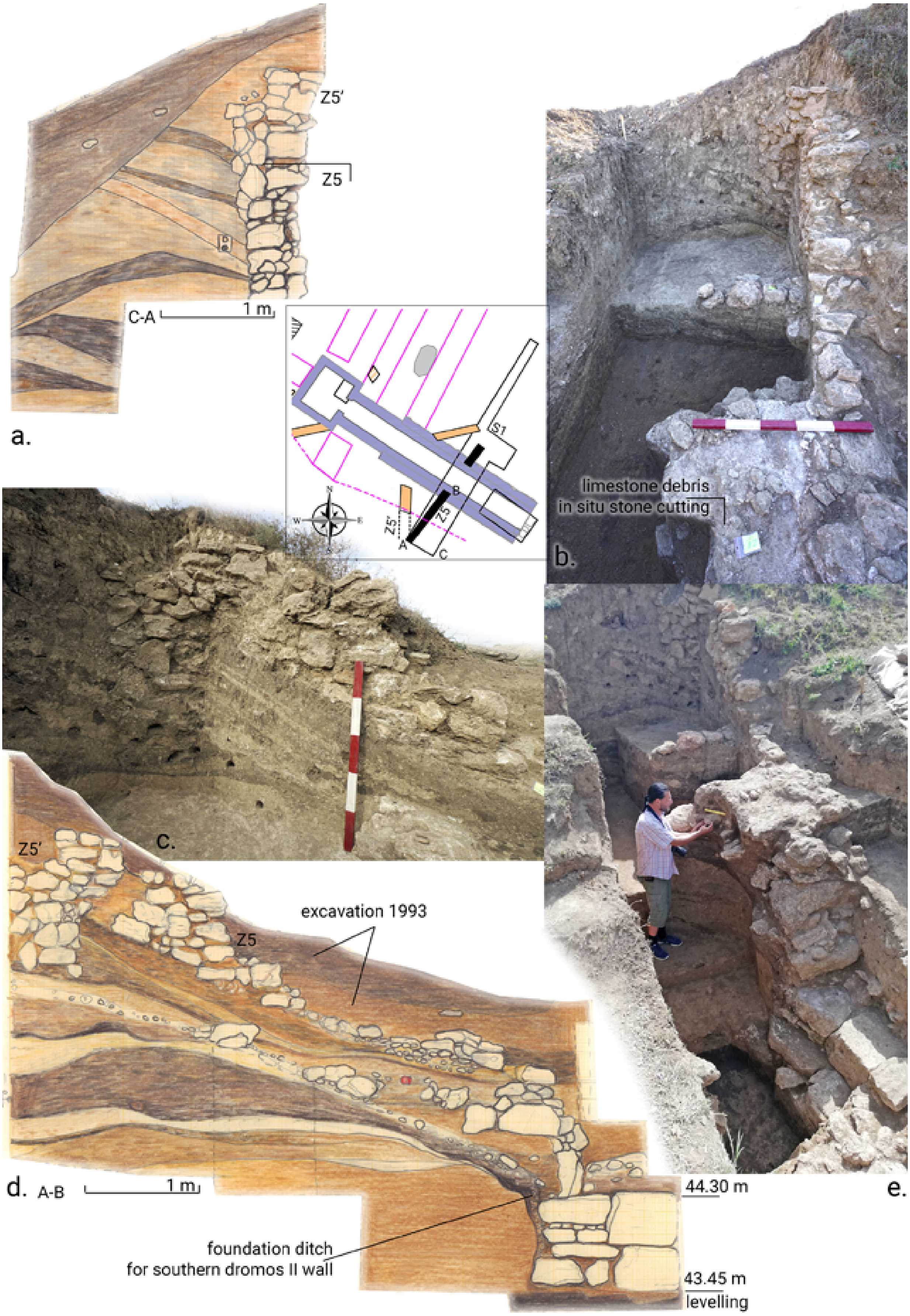

Figure 71. Trench S1, southern sector; retaining walls built to sustain the southern wall of *dromos II*, interlinked with the embankment monticules (drawings by Fl. Marțiș).

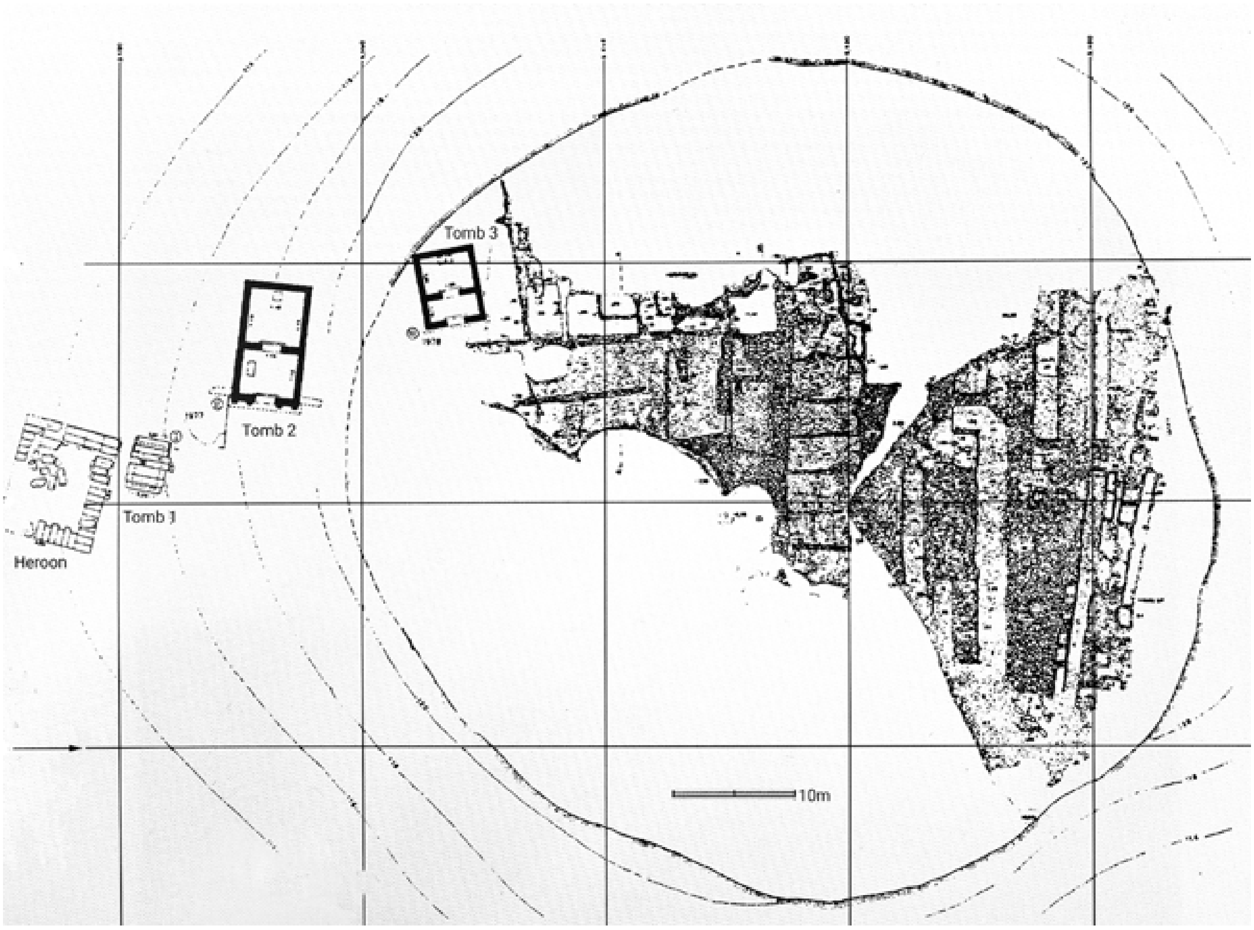

Figure 72. ‘Megali Toumba’, Vergina (after Drougou, Saatsoglou-Paliadeli 2008: 43, fig. 52).

Chapter 7
Sema

Figure 73. Aerial image (recorded by D. Ștefan) of the socle vestiges in relation to the tomb (now covered with a thin layer of soil), and the surviving southern sector of the embankment; view towards south.

It is generally agreed that even a simple mound could function as a *sema* – a funeral marker/sign of a grave (Henry, Kelp 2016), but in particular we will refer here to the additional marking of the mound by a surmounting built monument.

The Base. Masonry

Maria-Magdalena Ștefan

The element that distinguishes the funerary ensemble of the Documaci mound is the massive cuboid stone structure rising immediately west (2.6 m to 2.8 m, according to which block is selected) of the funerary chamber back wall – the socle (Figures 73-75). As we already argued in the previous chapters, the socle stands in the geometric centre of the mound and, ultimately, at the core of its entire architectural programme (Figures 34; 59). The *krepis*, embankment, inner reinforcement walls, altar adjoining the western part of the perimetral wall, the area for offerings in the north-west, and the surrounding exterior pavement fitted in a shallow drain, were all built as parts of the same funerary design scheme, gravitating in a tight spatial referenced system around this socle/pedestal. The socle has its faces parallel with those of the funerary chamber, with the south-west sides of both constructions positioned along the same axis. This is the main axis of the construction site. It passes almost through the centre of the 13-m wide *krepis* 'gate'/offering area in the north-west sector of the mound, with just a 1.3 m deviation towards north.

We interpret this central construction as a robust support, from which only a part had survived to our times, built from the mound's base up (or closely above it). It was meant from the beginning to remain completely buried inside the embankment. Its role was that of foundation/support designed to sustain a free-standing monument (*sema*) that was exposed on top of the mound. This monument is now completely lost, therefore its nature (statue, altar, stela) remains only a matter of supposition, but its former existence and massive volume can be certainly assumed based on the identified weight loading stress affecting the socle's masonry. A series of vertical cracks traversing multiple rows of ashlars, and the bends (collapses) of the horizontal line of the courses stand proof for more

Figure 74, The socle seen from the north-west.

than just the effect of the embankment weight, as will be discussed in the second part of this chapter (Figures 89-90).

Considered initially by Georgescu's team in 1993 as a second burial chamber, it unfortunately received poor excavation treatment. In his search for an entrance, Georgescu removed a consistent part of the surrounding embankment deposit, an action that led to the interruption of the stratigraphic relations of most the socle's preserved elevation. Moreover, it seems that Georgescu actually dug a pit inside the structure's central filling. A single photograph, dated probably 1993, stands proof for this, serving also as indirect documentation for the nature of the socle's inner core (Figure 76/d). The architect Anișoara Sion was the first to propose the structure's role as a base for a funerary monument. She made the only existing two sections of its faces, one in detail for the eastern side (where trench SV/1994 reached the socle's base (Figure 80/b), and a sketch of the northern side margin (Figure 80/a). Trench SV/1995, documented by Mihai Ionescu, links a portion of the socle's lower ashlar courses with the adjacent embankment to the north (Figure 81), while the documentation available for small trench SV/1994, also made by M. Ionescu and further integrated by A. Sion, reveals some details of the stratigraphic relations between the socle and funerary chamber (Figure 80/a). Recent digitisation, spatial referencing and integration work on these older data grounded the further presentation of our observations. Left uncovered to decay under the elements since 1993, the socle was once more severely destroyed in its upper part by a second mechanized dismantling event in 1999. No new excavations have been made around the socle since 1995.

The structure has four faces built of large, squared limestone blocks dressed only on the contact surfaces, ensuring dry-joints, arranged in rows of various heights (coursed ashlar-style masonry). The course heights range between 20 cm to 47 cm (with a medium around 30 cm), while the lengths of the ashlars can measure up to 1.20 m, 1 m, 90 cm, 70 cm, 62 cm or 55 cm. The corners were created using massive blocks occupying a place in two adjoined faces. This ensured the tightness of the structure and also the regularity of the horizontal courses shared between all the faces. The face walls were estimated to measure between 70 to 90 cm in width. The inner space defined between these four faces was filled with *emplecton* – a compact mass of rubble, limestone debris and yellow loess. Despite the rough and bulky aspect of the ashlars' exposed faces, which were practically left unworked as in the quarry, the structure overall has horizontal joints outlined in recognizable coursed lines (Figures 74; 76).

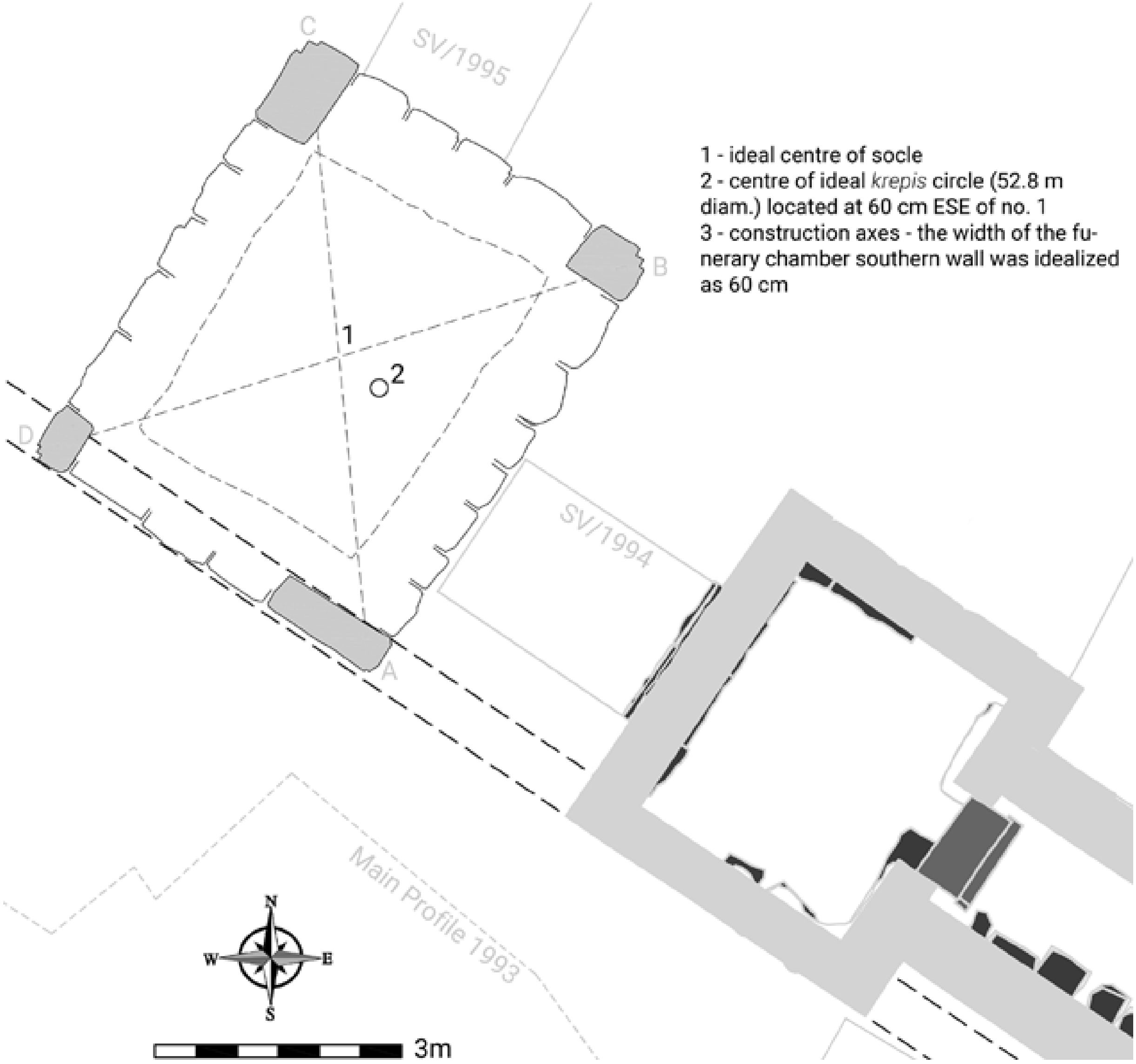

Figure 75. Ground plan of the socle in relation to the tomb. Their eastern sides were aligned along the same construction axis.

Even if levelling slabs, either isolated (Figure 78/a) or in rows (Figure 74, face CD, R11), small filling adjustments of the gaps and joints cut in steps, breaking the overall horizontality of the courses (Figure 78/b), are also visible, they are not generalized (it is not broken ashlar masonry style). They just demonstrate the effort the builders made to obtain continuity in the horizontal joint lines, especially towards the corners, where the large block of one row had to fit into the same horizontal bed with the adjacent face. For example, the block of corner C on Row 11 corresponds to face BC with one course (Figures 74; 76/e) of blocks and, on face CD, with one main course and a levelling row of slabs – ensuring the fitted alignment of the next course at the same bed level on both faces.

The blocks were laid in horizontal positions with only incidental exceptions (Figure 78/a). The structure's corners were sharply defined by being accentuated through vertical drafted margins at plumb (Figure 77). In fact, to these drafted corners the ancient builders paid the greatest attention when dealing with the exterior aspect of the structure, as they ensured the good vertical alignment of the corner blocks. Despite other modifications suffered in time by the stone structure, the verticality of the preserved corners remains unaltered. The depth of the drafting edge is 7-8 cm.

Due to the blocks' irregular exterior aspect, the dimensions of the sides may vary, at centimetre level, according to what block is taken as reference. Measurements between the corners defined by the vertical drafted margins are preferable, even if the volume of the blocks taken overall outturns them. These values describe the socle in plan as a rectangle

Figure 76. The socle: a-b) eastern side; c-d) southern side; e) western side; b) a photo by A. Barbet (1994); d) a photo by Georgescu's team from the 1990s.

Figure 77. Socle, corners with drafted margins.

measuring 4.94 m (face B-C) x 6.06 m (face A-B). Its maximum preserved height was, in 1994, 5.53 m from the base of the foundation plinth up. On top of this plinth (found in the trial trench made in 1994 near the eastern socle side, drawn as having just 15 cm in height and a displaced position outside the main line of the wall, of 30 cm), Sion documented 15 ashlar rows (Figure 80).

The upper rows had been ripped off during mechanized looting in 1999 (one course of face B-C, three courses of face C-D), along with ashlars in the middle section of face A-B from five different courses and two blocks from the upper part of corner B (see comparison between a and b in Figure 76).

Between the ashlar rows and plinth there was a layer of irregular shaped and sized stone filling, about 29 cm high, probably also part of the foundation. We numbered the courses from this stone filling up. The masonry style, especially the use of the vertical drafted margin, is typical of many fortresses in the Aegean in 4th-3rd c. BC (Lawrence 1979; Adam 1982). Especially relevant is the case of the Hellenistic enclosure of Histria (Angelescu 2018: 257-257, pl. 26-27). The technique was also attested applied in the walls of local urban centres of Sboryanovo, Kabyle and Philipopolis (Stoyanov, Stoyanova 2012), and in the masonry of the Caryatids Tomb (Chichikova *et al.* 2012: 22, fig. 29; Stoyanov, Stoyanova 2012: 729, fig. 8).

Without any new excavation in the area of the socle's foundation, and in the general context of having a really disrupted stratigraphic deposit around the its structure, the interpretation of any possible relations with the surrounding embankment and funerary chamber was derived and grounded solely on the overall comparative and critical analysis of the older

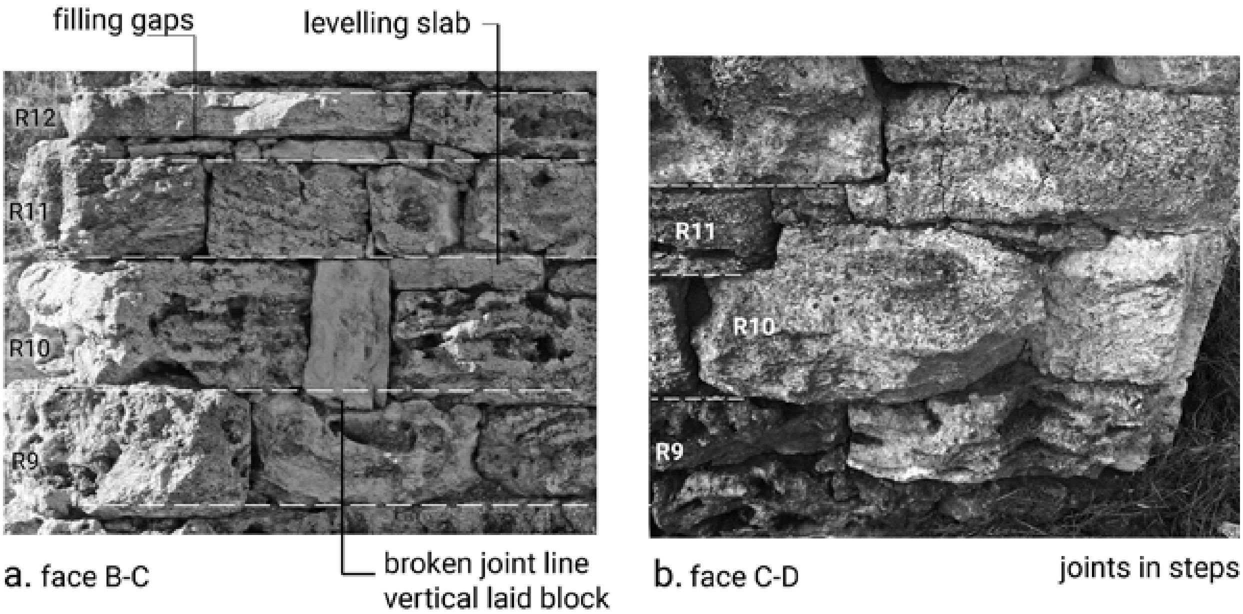

Figure 78. Socle, details of construction details: a) northern side; b) western side.

documentation. The absolute elevation value for the socle's plinth base (deduced by us in relation to Sion's drawing and our measurements inside the funerary chamber) is 43.63 m; this is with *c.* 20 cm above the top of the funerary chamber's plinth and 10 cm under the walking level in the *dromos* II entrance.

Stratigraphy and integration in the mound construction project

Maria-Magdalena Ștefan

The two profiles available for trench SV/1995 (Figure 81), excavated perpendicular to the B-C socle face, and the main east-west profile (1993) of the mound (Figure 62), located 4.5 m south of the opposite side (D-A), disclose a similar stratigraphic situation: the socle was built at the same time as the mound adjacent to these two sides, in a gradual rise and with a new soil layer added and compacted against the walls of the socle once each row, or two rows, of ashlars were fitted in their places. Oblique layers of limestone debris resulted during the ashlars' working *in situ* were drawn intercalated between layers of soil of various colours and regular heights (30-35 cm). This sequence can be observed south of socle face D-A, between courses 6 and 11, while in trench SV/1995, they support face B-C, between rows 3 and 7. The soil layers built to support the northern socle face measure between 60 and 10 cm high. None of these three sections reached the socle base.

The stratigraphic situation disclosed by the two east-west profiles of trench SV/1994, excavated perpendicular to the middle of socle face A-B appears, however, quite different to the previous one. This trench, 2 m wide and 2.6 m long, uncovered the socle from the foundation up to the sixth ashlar course. In the two small vertical sections, initially recorded by M. Ionescu in 1994 and then reintegrated by A. Sion in her main architectural sections- Figure 80/a, we recognise the profile of a pit, excavated from above row 6 of the socle to its foundation, 1.3 m wide in the superior part and 35 cm wide at the level of the foundation plinth. This pit was excavated in a previously built sequence of layers. This piece of stratigraphic data was read by Sion in her architectural scheme as an indication for the building of the socle at a later phase of mound use, after the ancient builders scraped the tomb to the *extrados*. It was also one of our early working hypotheses that an enlargement of the mound, linked to a subsequent burial in the tomb, was accompanied by the construction of the base for a free-standing monument and that of *dromos* II was believed initially to be a second phase extension of *dromos* I. A hand-drawn sketch by A. Sion (dated 1994) documents, in an unscaled representation, the relationships established between these layers, the funerary chamber back wall and the socle (Figure 79). Our reading of this drawing, together with data recorded for SIII/1995, is that the layers represent the embankment built during the assembling of the funerary chamber, in thin compacted layers separated by fine stone debris, a situation similar to SII/1992, for *dromos* I (Figure 62/c-d).

As described in Chapter 6, there are no clear stratigraphic arguments to support unequivocally the building of the two *dromoi* sectors as different building/use phases. In fact, there is a much more conclusive context that discloses their unitary design, with embankment layers assembled from the initial base up, which eventually cover the funerary chamber or include the support walls for *dromos* II. Taking into consideration the stratigraphic information for the area south of the socle (included in the main east-west profile of 1993) and the sections available for SV/1995 (located just 3.5 m NNW of SV/1994 and the pit represented there), we propose the following sequence of events as the most appropriate explanation: the chamber tomb and its surrounding/supporting monticules were finished before the socle, but not as phases, but as stages in the general building process. The foundation pit was visible only on side A-B of the socle, the one located close to the chamber tomb. It is a similar situation to the foundation ditches dug for *dromos* II, for which the stratigraphic sequence and symmetry of the building monticules do not fit with the hypothesis of a second phase.

The documentation obtained in SV/1994 shows also that the plinth for the socle foundation was fitted in a previously built layer of yellow-brown loess, 1 m thick, with straight base, which was heaped on top of a yellow loess layer – both located above the initial levelling (Figure 80/a). This 1994 excavation did not progress further down than the funerary chamber plinth on one side, or the socle plinth on the other. Some data is therefore missing. The legend available for these drawings translated the two mentioned layers as 'natural'. However, taking into consideration our current updated understanding of the stratigraphy, we may consider them in fact layers of the embankment (for which an indication exists also in SIII/1995, where, beneath the vault, the northern funerary chamber wall was supported by a thick rampart of yellow soil). Our trench S9/2018, made inside the funerary chamber, showed that the wall plinths (at least the eastern one) was laid on top of the initial levelling with dark-brown well beaten clay – here visible in the area of the northern wall plinths and of 40 cm thickness. Based on these truncated data, we observe that the socle was built above the initial levelling in an already heaped embankment. Is this situation, together with the foundation pit for face A-B – perhaps a clue for the building of the socle in a later, major renovation of the mound project.It would be hard to imagine an initial mound for the chamber tomb that ended just 2 m from its back wall. By contrast, we see as unaltered the layers built simultaneously with the *dromos* I and funerary chamber masonry, stretching seamlessly towards the north, with traces of stone debris from the *in situ* stone working spreading along form some metres. This part of the mound (seen in SIII and SII) was surely built in a single phase, not only with the tomb, but also with the reinforcement wall Z12, which was, as the geophysical survey revealed, the same structure as Z14. Z14 was a buttress wall for the embankment built at the same time as the socle. All excavations proved the construction of every tumulus element as being related to an initial system of levelling made with the same type of soil, encountered either under the funerary chamber, *dromos* II walls, or altar (Z3) on the western side.

Moreover, the embankment, as described in the main east-west profile/1993, shows an interlinked assembling of the layers for the two *dromos* sectors. The massive red layer that finally seals the funerary chamber vault was built over some of the layers that can be linked with the socle construction. At the same time, the stratigraphy documented for SIII/1995 shows that it is highly likely that this red layer was formed starting from the base of the northern monticule – as part of the building sequence for the tomb.

The embankment located to the north of the socle was built as a rampart inclined towards its B-C face, with all the layers of the sequence assembled one on top of another from the same base up. The length of this base, which was sustained by the reinforcement wall Z14 in the northern periphery, was about 14 m. The socle was thus obviously never visible – it was built inside the mound and sustained by it on the sides. The treatment of the embankment adjacent to face C-D remains harder to reconstruct due to the improper excavation method of 1993, which removed, mechanically, most of the stratigraphic connections. The remaining sector of the mound in that direction is *c.* 4.5 m away to the west of the socle. Trench S6/2017 cleaned the superior part of this remaining profile (Figures 48; 65), while S10/2019 begun to explore the deposit from the opposite direction. The profile of S6 showed that, from the seventh socle course down, and at least as far as the forth, where the excavation stopped, the embankment was built in a similar manner to the sectors adjacent to faces BC and D-A – alternating layers of soil with stone debris (Figure 47/d). Above this, and under the recent deposit from the dismantling of the socle, a thick layer (1.7 m maximum) of rubble stones can be seen, supported by reinforcement walls Z10 and Z13. The stone layer can be seen along at least 4.5 m (north-south). The excavation was basically a clean-up, and no stones were removed, so perhaps their visible arrangement did not reflect exactly the building style. They were certainly disturbed by erosion over the last 24 years since their initial uncovering. Regardless, a tendency for a stacked piling of the boulders, in the fashion of a rubble wall, can be noticed in any event. The fact that these stones preserved their exposed position in the profile for over two decades is a clear indication they are part of solid structures that continue under the embankment, towards the west. Considering that at this part the embankment was much thinner, due to the courtyard in the north-west sector of the tumulus, reserved for ritual offerings, the support for the socle

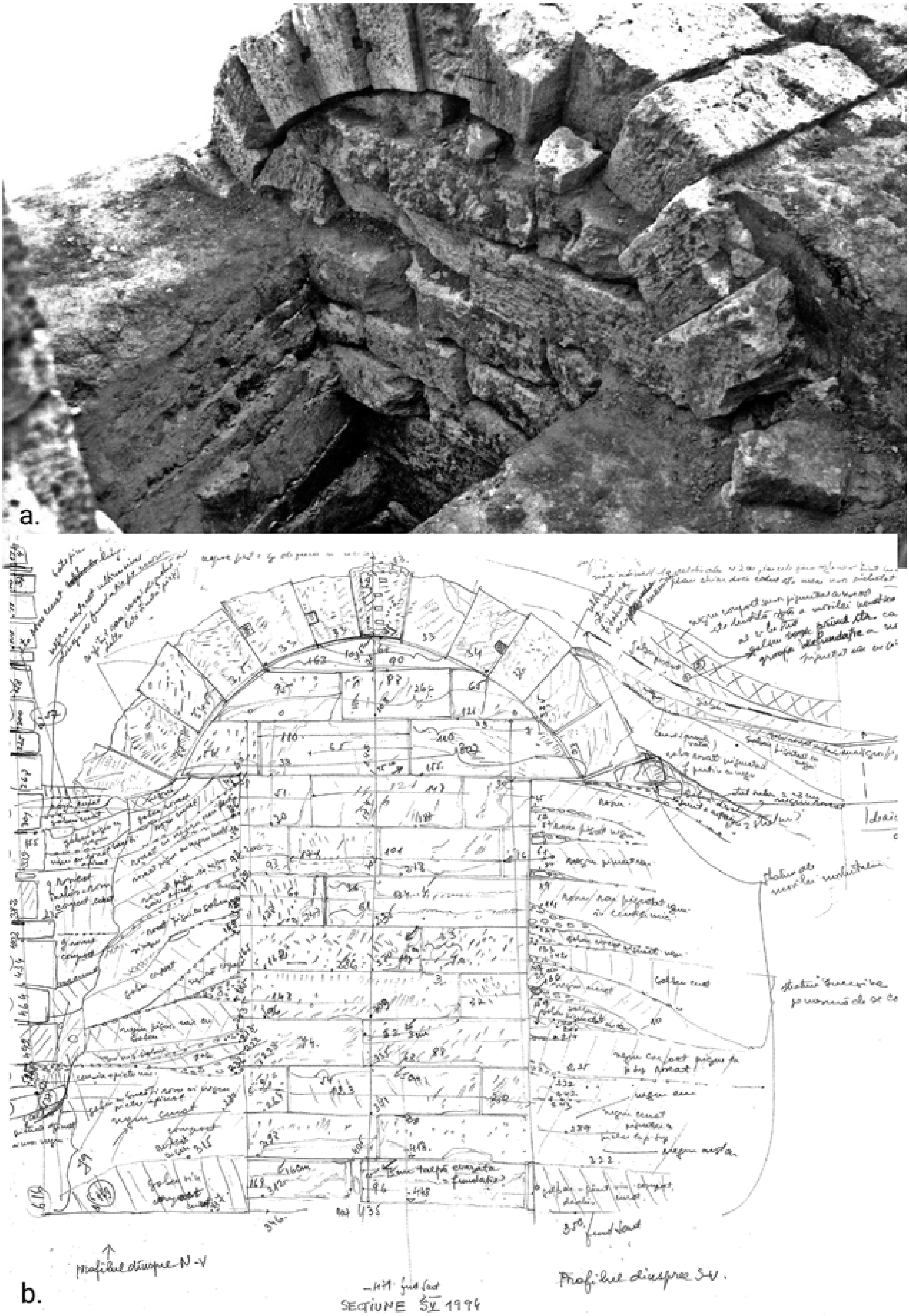

Figure 79. The back wall of the funerary chamber seen from outside, in trench SV/1994: a) an image made during the Georgescu digs; b) sketch by A. Sion made in the field.

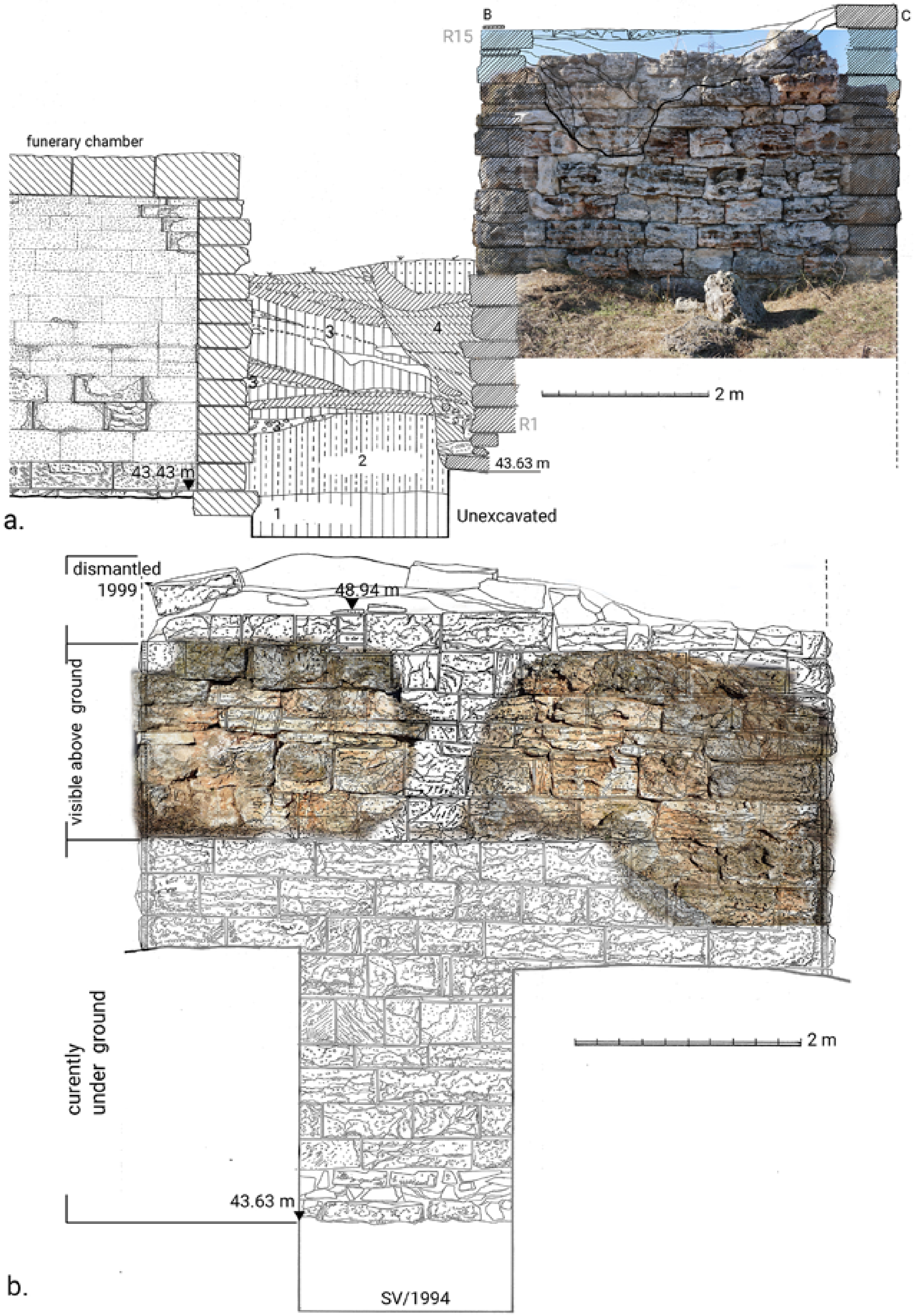

Figure 80. Socle; drawings by A. Sion corelated with current images and elevation values: a) northern side; b) eastern side. 1 – yellow loess; 2 – brown-yellow loess; 3 – stone debris; 4 – brown.

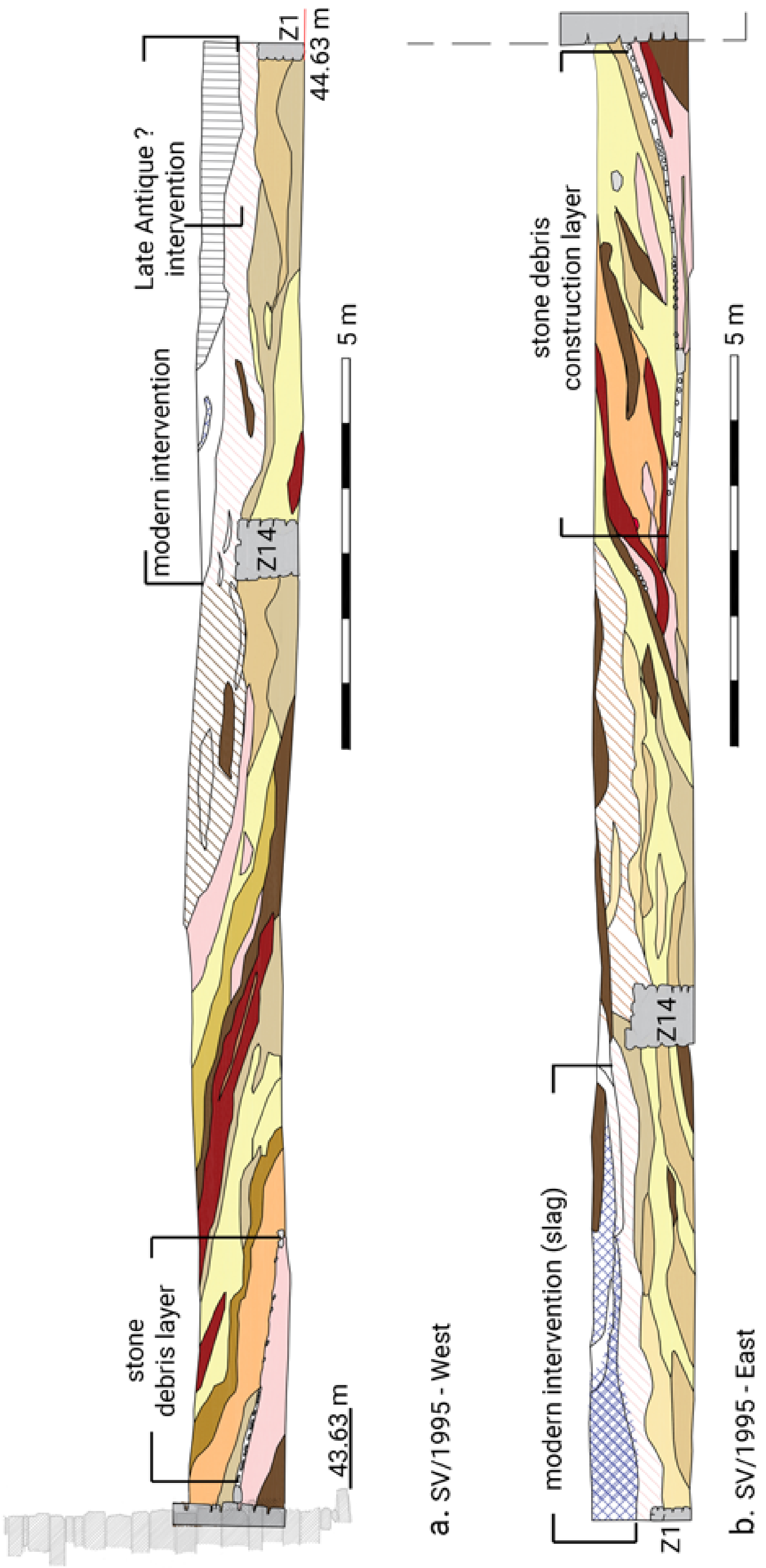

Figure 81. Stratigraphic profiles for trench SV, drawn in 1995 by M. Ionescu, digitized, commented and spatially referenced with the drawings of A. Sion and the site plan by M.M. Ştefan.

could have been weaker. This stone arrangement, part of a larger structure, as suggested by the geophysical survey (Figure 47/c), could be a reinforcement for the socle on this weaker side of the mound, but it could be also something else, e.g. an access ramp to the monument located on the top of the mound, or even a second tomb. Only future excavations in this part can solve this with any certainty.

Assessing the initial height and visibility significance

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The socle was a support for a heavy structure. As works on the surrounding stratigraphy and masonry of its currently visible sides suggest, it was designed to remain completely buried in the embankment. Therefore, even if today the socle survives to only *c.* 5 m, 3 m below the maximum preserved height of the mound, we have to assume the socle reached the mound summit, where the monument was placed, whatever that initial height was. An estimation of the slope, using the roof top for the entrance in *dromos* II as a starting point, the highest preserved original embankment as intermediary, and the centre of the socle as a terminus, we obtained an initial height of 8.9 m above the ancient walking level in *dromos* II (which practically corresponds with the level for the foundation plinth of the socle), or 8 m above the actual terrain level outside the mound (to the north) – 45 m above the Black Sea (Figure 82). The tumulus could had been in fact even taller. We do not have enough data to propose a maximum variant for the original slope.

The pedestal was destroyed sometime during the 18th-early 20th centuries, and possibly once more after the 1960s when the mound was consistently affected – with layers removed altogether in the northern sector of the mound, and deposits of soil added in the area of the tomb entrance. In that period, almost 1.7 m of its height disappeared on the maps. A continuous layer of limestone debris, recorded on the 1993 main east-west profile for over 16 m, separates what we consider to be soil in a secondary position, from the embankment preserved *in situ*. These are, however, the lowest possible heights, determined for the smallest slope (Figure 62).

The impressive quantity of soil in a secondary position, especially yellow loess, mixed with layers of rubble found in the current upper layers of the mound, has to come from the actual digging inside and around the socle during the large-scale lootings. Massive limestone blocks with traces of cutting were found mixed chaotically in this layer (Figure 49-50). The focus of the ancient looting on the socle shows that it had somehow attracted attention, possibly because the remains of stone constructions were still visible on the surface. Perhaps more appropriately, one should say quarrying rather than looting, as the socle structure was recycled as an accessible source of massive quadrae. A note written in 1939 by a former guardian of the National Commission of Monuments, archived in the Institute of Archaeology in Bucharest,[1] mentions quarrying activities at a site called Documaci, 'on the lake shore', some 4-4.5 km west of the city, which were stopped when traces of ancient structures were found ('a limestone mortar with traces of smashed brick'). This location could be either the hill in its entirety or the neighbouring valley to the east, and not necessary the tumulus (see Figure 27), but a possibility remains.

Even if the specific type of monument surmounting the mound cannot be established, what we can still grasp is the visibility potential. Such a monument was essentially meant to be seen. An identification of the areas from where the monument made an impression could help in establishing who were the intended recipients of the symbolic message it carried.

This viewshed analysis (Figure 83) is particularly relevant in singling out the Documaci mound in relation to the city and the rest of the Callatian necropolis. We used the LiDAR data collected in 2019 for an area of 254 km^2 around Mangalia, interpolated at 2.5 m (for calculus efficiency), from which we filtered out the artificial hill of the modern military polygonal dyke (Figures 28-30). The obtained DEM has obviously numerous artificial deformities caused by the fingerprint of modern buildings, so we consider that in reality the ancient terrain would have had an even better clearance factor. As a first step we checked the visibility area (12 km range) from the top of the mound in order to have a base for assessing backsight as reciprocal visibility (Figure 83/a). We used a 2-m high transmitter located on the actual terrain, which we know is lower by at least 2-1.7 m than the original summit. We then calculated the visibility back from that area of the ancient city which was covered from the mound – i.e. the north-eastern sector, where the terrain is the highest, by calculating individual lines of sight along the altimetric profile established between the two locations. Several values were tested.

We noticed that if we used a viewer standing on the actual terrain of the former citadel, the mound was visible starting from its sixth-metre mark up. If we take the Hellenistic layer as a reference, which lays *c.* 2 m beneath the current street level, the mound was visible only from its ninth-metre mark up. This calculation remains however quite difficult to make, considering the significant interference to the LiDAR DEM by the modern structures. A transmitter with zero elevation in the city (current terrain, filtered by modern buildings)

[1] IAB, Fond MNA, D37, 1939A, file VI. We thank Irina Achim, from the Institute of Archaeology in Bucharest for bringing this archive material to our attention.

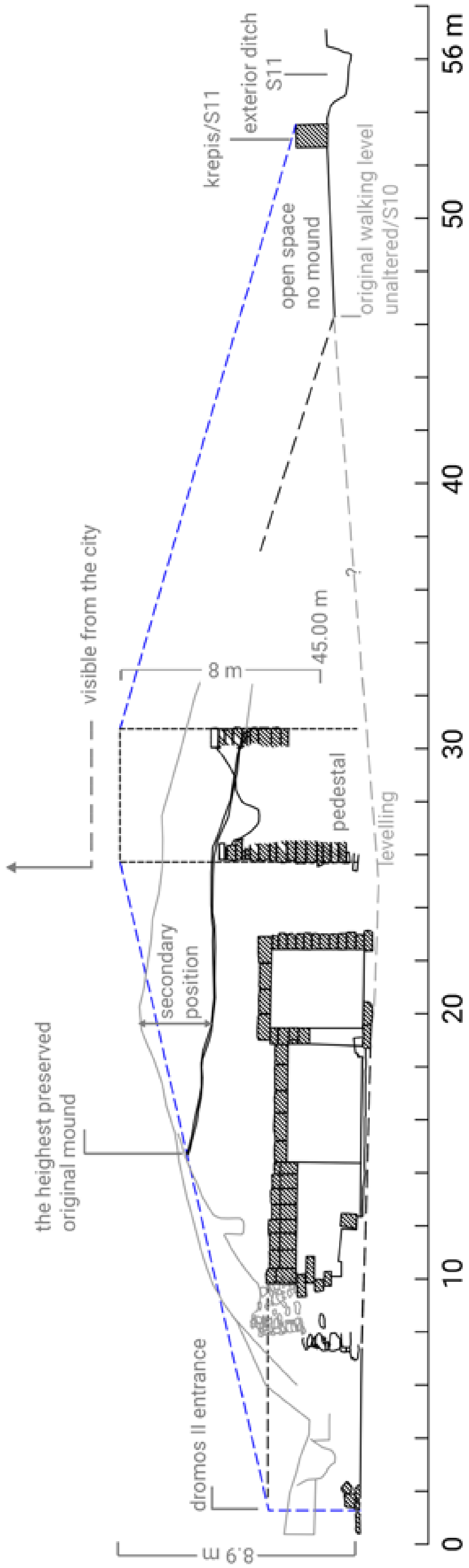

Figure 82. A composed general section (east-west) through the mound, placing in relation the tomb, socle, krepis and embankment preserved in current state. The minimum slope needed to cover the tomb and the highest preserved sector of the original mantle give clues to the minimum original tumulus height: 8 m in relation with the terrain in the north/8.9 m in relation with its original entrance. 1 m higher and the tumulus could have been visible from the city.

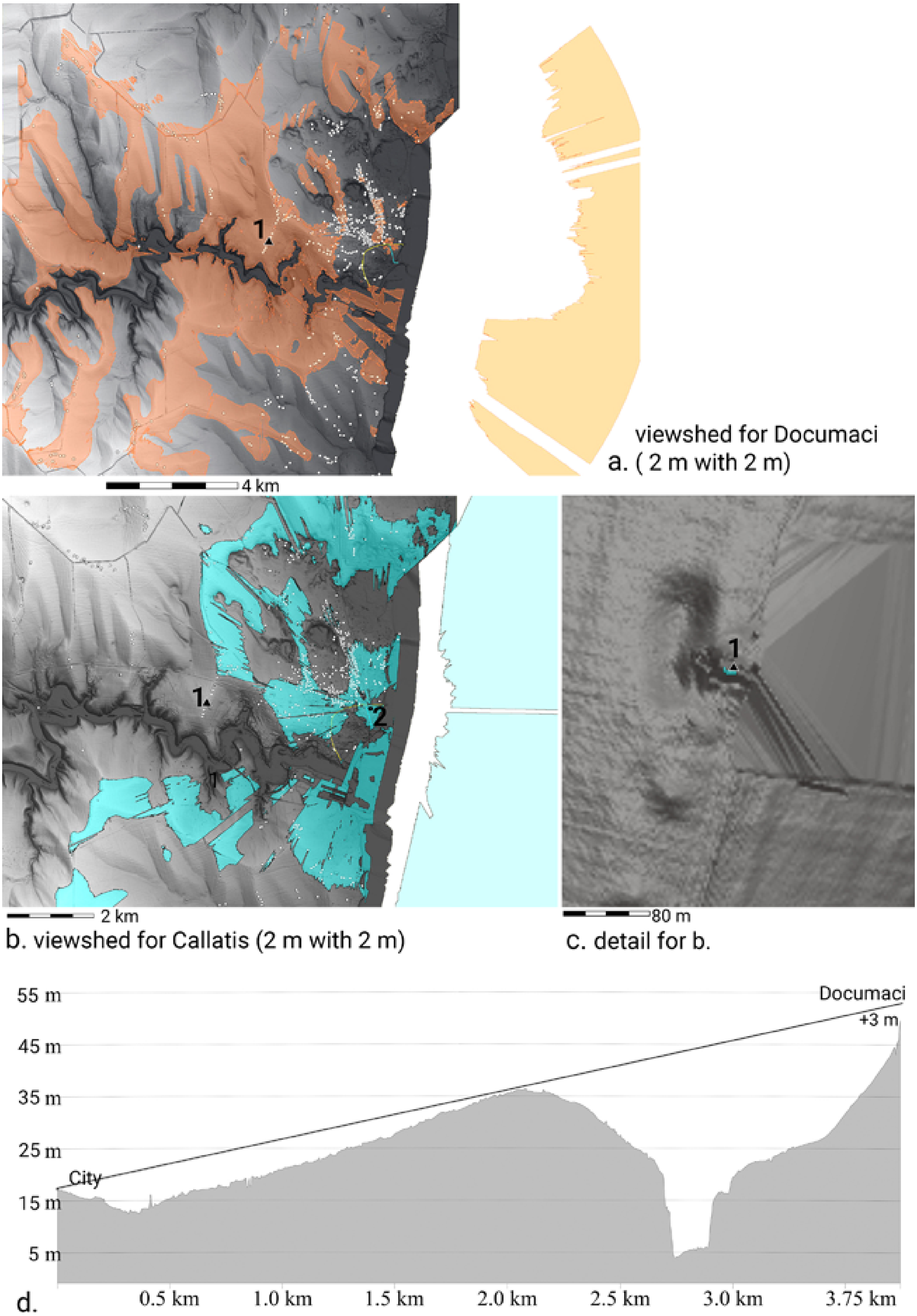

Figure 83. Viewshed analysis assessing the intervisibility between Documaci and the Callatis acropolis on current LiDAR data.

was taken as an approximation for a viewer standing on this original layer.

The viewshed analyses evidence reveals first of all that the distribution of the tumuli in the Callatis necropoleis, especially those arranged in regular alignments to the north and north-west, were overlapped by the visibility covered from the citadel. The entire southern ridge of Documaci Hill was not, however, visible, being blocked by the high shores of Lake Mangalia. This might explain the lack of cadastre markers on Documaci Hill, and the distribution of the tumuli there (less numerous than in other visible areas) as referenced to a different element (the ridge road).

The Documaci mound itself, if less than 9 m high, would not have been visible from the city (at the level of the original Hellenistic layer). If 9 m high or more, being positioned at the highest point of the ridge, it would become the only landmark observable from the city's highest sector – its north-eastern one, near the main city gate controlling the road to Tomis, from which the entire cadastre of the *chora* was derived. This was in fact the main nucleus of the polis, preserved even later in the Roman-Byzantine period, when the urban area was much diminished (see Chapter 3.2). The tumulus, and especially its surmounting marker, were visible from the northern sector of the Callatis necropolis, near the city walls – an area for which there is reason to consider that it was reserved for preeminent citizens and their families.

The visibility analysis results come close to the height estimation, based on the minimum slope (Figure 82). In the light of this potential visibility, the choice of location reveals an intent for it to stand out, while preserving, nevertheless, a direct connection with the ancient city

Apart from this special relation in terms of visibility established with the city, the Documaci mound was noticeable in the surrounding landscape, especially by travellers coming to Callatis from the west. In particular, it was a landmark for navigators, at large distances along the shore, especially if we add the monument to the mound's height.

Analogies for Documaci *sema*. Tumuli and monumental funerary markers in Hellenistic times

Maria-Magdalena Ștefan

What can we say about the monument placed on top, considering that no discernible part of it has survived? Taking into account the effort to build such a massive base, and the static load effect upon its structure (see further Chapter 7.5), we have to deduce that this monument was relatively heavy and would have sunk if just fixed into the embankment. A deep foundation ensured the dispersion of weight forces towards the base of the mound, while the lateral oblique layers of beaten soil, part of the embankment, delimited at their base with secondary walls of rubble, could have acted as ramparts for the stone base, enlarging the action surface of the pedestal and diminishing thus the value of the load per surface unit. The size of the pedestal (roughly 6 m x 5 m) gives us also the maximum surface the exposed monument could have occupied. It could have been a *naiskos* or a large stone statue (or even of marble), positioned perhaps on an additional stepped pedestal. It could also have been a temple-like structure with engaged columns on a high podium, similar to the mausolea in Asia Minor. Statues, stelae and funerary *naiskoi*, with scenes in low relief placed on podia and low platforms, used as grave markers were widespread in various places within the Hellenic world since the Archaic period, and going into Classical times, with periods of interruptions – especially for Attica, i.e. the Decree of Demetrios of Phaleron in 317 BC (Palagia 2016; Kurtz, Boardman 1971). The rectangular stone base built over the three pyres in Callatis' northern sector, towards the end of the 4th c. BC, could also have been crowned by *semata*. The particularities of Documaci are that the *sema* was included in the funerary project of a tumulus and that the dimensions of the pedestal foundation sustain the hypothesis of a massive marker.

The closest analogy for such a base, associated with an early Hellenistic tumulus, comes from the Amphipolis Kastas mound, a funerary ensemble with which Documaci shares a number of other features, too, even if on a considerably smaller and more provincial scale. A stone construction on the top central part of the partially artificial hill was researched at Kastas during 1972-1973 by the excavator of Amphipolis, D. Lazaridis (Michaud 1974: 675; Orlandou 1973; Orlandou 1974). It was described as being built at the same time as the mound, encapsulated in an undisturbed layer of sand, having only one well-preserved side (possibly square, 10.15 m long side and 3.4 m in height), and the eastern and western sides only partially. It consisted of a wall built of roughly hewn blocks placed in approximately isodomon style and a fill of uncut stones (Figure 85/a-b). The construction technique and central position resemble the situation of Documaci, even if the images recorded in the 1970s (Orlandou 1974: 44, fig. 34; 1973: 31, fig. 23) seem to document a less well-preserved structure.

B. Schmidt-Dounas (2016) proposed that the base of Kastas might have supported a large *stela* or a funerary pillar with a marble vase on top, as depicted in a mural painting found at Pella in a cist-tomb of the early 3rd c. BC, the so-called 'tomb of the Philosophers' (Lilimpaki-Akamati 2007: 64-66, fig. 50-52). The painting at Pella represented a horse race in a landscape of mounds,

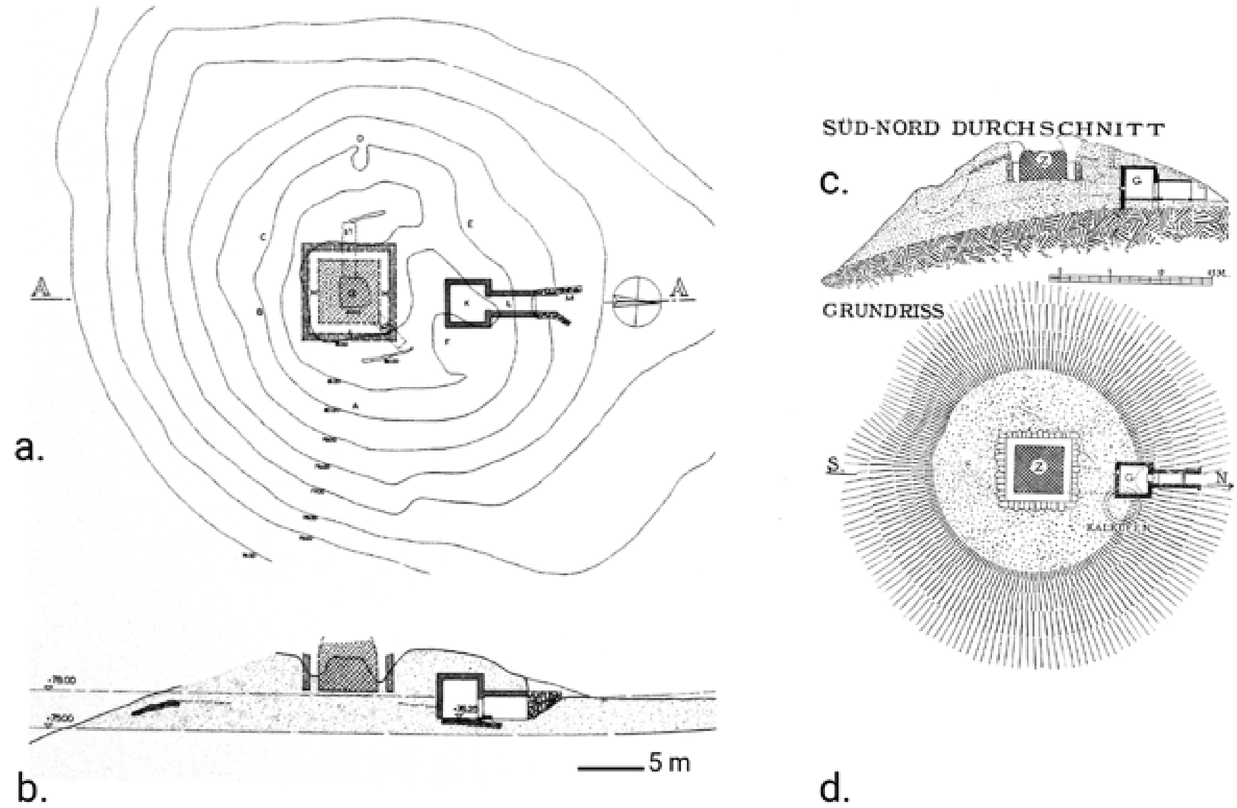

Figure 84. The 'Tomb of Erotes', Eretria (a-b: after Mangoldt 2012: Taf 48/5B50; c-d): after Vollmöller 1901: 335, fig. 1).

crowned by markers, of a greater height than the mounds themselves. It is probably a representation of a contest carried out in a cemetery as part of the funerary ritual.

Lazaridis (Orlandou 1973: 43; 1974: 51-52, pl. 68) interpreted this stone structure as the base for a funerary monument that had once topped the mound, recognizing similarities with an ensemble built in the second quarter of the 3rd c. BC in Euboea – a tumulus covering a Macedonian-type tomb known as the 'tomb of the Erotes' (Huguenot 2008; Mangoldt 2012: 136-7). This tomb, associated (as the inscribed names of the occupants suggest) with a family of Macedonian origin living in Eretria, had exactly in its centre a square structure made of unfired mud-bricks linked with lime mortar, built *c.* 2 m higher than the funerary chamber floor (Figure 84). The adobe structure, which tapers conically upwards, was described as massive, filled with sand, having a side measuring 5 m long and a height of up to 3 m. It was surrounded on all sides, at 75 cm distance, by simple walls of rubble stones rising 'to the height of a man' (Vollmöller 1901: 336). These walls protected the adobe structure against the heavy pressure of the embankment. The structure, interpreted by Vollmöller as the base of a 'σήμα', a heavy monument crowning the tumulus, after the model of the tomb of Alyattes at Sardes, as described by Herodotus (I, 93); this had its sides parallel with the funerary chamber – like at Documaci. Another similarity is the observation the German archaeologist made that the mound was built in a sequence of phases, with the vaulting of the funerary chamber finished before the rising of the base was completed. In the higher layers of the mound there were contiguous layers of marble shards (possibly from the *in situ* finishing of the funerary monument itself), as well as regular and apparently intentional radial layers of field stones of various sizes used for resistance against the loose earth (Vollmöller 1901: 334). At Documaci also, on the western side of the socle, a layer of quarry stones was observed (Figures 47/d; 48). At Eretria, a second example of this form of resistant substructure for a heavy monumental crowning feature was documented in the central part of a large tumulus, 'like that on the plain of Marathon', where a tower of stones 20 feet (6.1 m) high and 15 feet (4.6 m) square was found by Richardson (1894: 309).

In recent years, following the new excavations at Kastas by K. Peristeri of the 38th Greek Ephorate of Antiquities, supported by the architect M. Lefantzis, an hypothesis gained momentum that the famous 'Lion of Amphipolis' stood on top of the hill (Roger 1939; Broneer 1941) (Figure 85/e), a theory that stirred much reaction (Peristeri 2016).

The seated lion of Amphipolis, reconstructed in 1937 (Figure 85/g), traditionally considered a colossal grave marker, is perhaps the most famous early Hellenistic-period statue in Greece. At 5.3 m high, it weighs *c.* 30 tons, carved from Thasian marble. The fact that the lion proper was discovered in a different location, 6 km downstream of Kastas, on the right bank of the Strymon, but in association with pillaged marble blocks once part of the marble retaining wall of Kastas mound (Miller, Miller 1972), only complicates things. The main inconsistency seems to be that at the site of Marmara, where the Lion pieces were found, in 1913 and then again in 1916, traces of an *in situ* base foundation (Figure 85/c) were also attested (Collart, Devambez 1931: 184-190; Broneer 1941: 18-26, fig. 5-7). The rectangular structure (9.96 m x 3.38 m), preserved to a height of 1 m, was assembled as a complete feature of squared blocks of porous limestone laid in regular courses, along a slope, and thus having different depths for the foundation ditches (Broneer 1941: 17). L-shaped blocks were used at the corners. The corner blocks had vertical drafted edges, while the exteriors of all the stone pieces were not carefully aligned – an indication the structure was buried in the ground. These two features (Figure 85/f, d) resemble the situation at Documaci. Was Marmara the original location of the Lion – close to an ancient bridge over the Strymon (Broneer 1941)? Or was it a later setting after the Lion was taken down from the mound (Corso 2015: 200)? Radiocarbon dates for wooden pilasters found close to the ancient city's north-western gates show that during the 4th c. BC, but also earlier and later, the bridge was in fact located in a different spot, 3 km to the north of the Lion, in a more secure position near Amphipolis' fortifications (Maniatis *et al.* 2010), leaving, thus, the Lion at Marmara in an unreferenced topography. Moreover, marble blocks from the retaining wall and the Lion were found scattered in other locations, too, suggesting the original monuments, wherever they might have been initially located, were dismantled and then used as building material for a Strymon dam, perhaps even since the Byzantine era (Bakalakis 1970). A fragment of the Lion's left shoulder was reportedly found on the Kastas mound (Corso 2015: 192).

The blocks from Marmara that were analysed during the 1970s by the American School of Archaeology were identified as belonging to six different architectural schemas (Miller, Miller 1972), of which some were decorated with engaged Doric columns and embossed shields. A reconstruction of the Lion of Amphipolis by J. Roger (1939), of the French Archaeological School, proposed that these decorative elements were also part of the Lion's original socle, after the example of the Lion tomb at Cnidus in Asia Minor (Figure 85/e).

Whether the Lion of Amphipolis had indeed crowned Kastas or not is of a lesser significance for our study here, and we will leave the resolving of this for the future, when the newer researches of Lefantzis and Peristeri have been fully published. What seems more relevant as comparanda for Documaci is the existence at Kastas of a deep base for a monument built 'with the mound', or at least with its upper part, and included in the embankment. At the same time, the possibility that a lion statue could have been the *epithema* at Documaci remains still a possibility, considering the centuries-old appeal of this particular creature in the Hellenic world as a funerary marker,[2] and also its renewed and valued symbolism in the context of increased references to Oriental royalty in the era after Alexander the Great.

For example, at Pella, to the south of mound A at Rachona, covering two cist-tombs of the last quarter of the 4th c. BC, low bases for four monuments were found, of which one (measuring 4.70 m x 1.75 m) sustained the statue of a lion (Chrysostomou 1984; Schmidt-Dounas 2016: 107). The other monuments were *stelai* and a Doric column. Another rectangular low foundation of *quadrae* (9.60 m x 8 m) was found near the initial royal tumuli at Vergina, functioning before they were all included in the larger Megali Toumba mound. It was considered by M. Andronikos as an heroon, dedicated to the royal cult of Philip II (Andronikos 1984: 65, 82, 229-230). Saatsouglou-Paliadeli considers it rather as a base for a group of statues honouring the dead (*exedra*) (Schmidt-Dounas 2016: 107). Another rectangular base of *quadrae*, built on one row (10.80 m x 2.70 m), on which several monuments had stood, was found destroyed in the eastern margin of the tumulus of Stenomakri Toumba at Aigai, covering three rich pit graves, surrounded by circles of dry walls (Figure 86). A marble volute crater, 1 m high, buried at a later date inside the destroyed base, remains the sole survivor of the commemorating set (Saatsouglou-Paliadeli 2006; Saatsouglou-Paliadeli, Kyriakou 2006). Significant here is the location of the base found at that part of the mound adjacent to the ancient road. Fourteen pyres were found on the tumulus and around the base, only in the eastern sector connecting with the road, attesting periodical ritual activity performed on site, relating to the cult of the dead (Kyriakou, Tourtas 2015).

These stone bases, located in the periphery of mounds, like the two at Aigai and the one at Pella, might better reveal, however, the functionality of the rectangular Z3 stone base structure researched near the *krepis* wall

[2] Reviews in Reinach 1913; Broneer 1941; Low 2003; Ma 2008. In particular, famous statues of Lions were known to have been erected in relation to collective graves of heroes fallen in battle (*polyandria*), e.g. at Thespiai, Thermopylae, or Chaeronea. The monument of Chaeronea, quite close in pose and style with the Amphipolis model, may be especially significant as a chronological reference. A brilliant demonstration by Ma (2008) argues for a date of the Lion after 316 BC, and before 275 BC, proposing a convincing connection with Cassander's revisionist programme, which changed some of the decrees of Philip II, including the refoundation of Thebes.

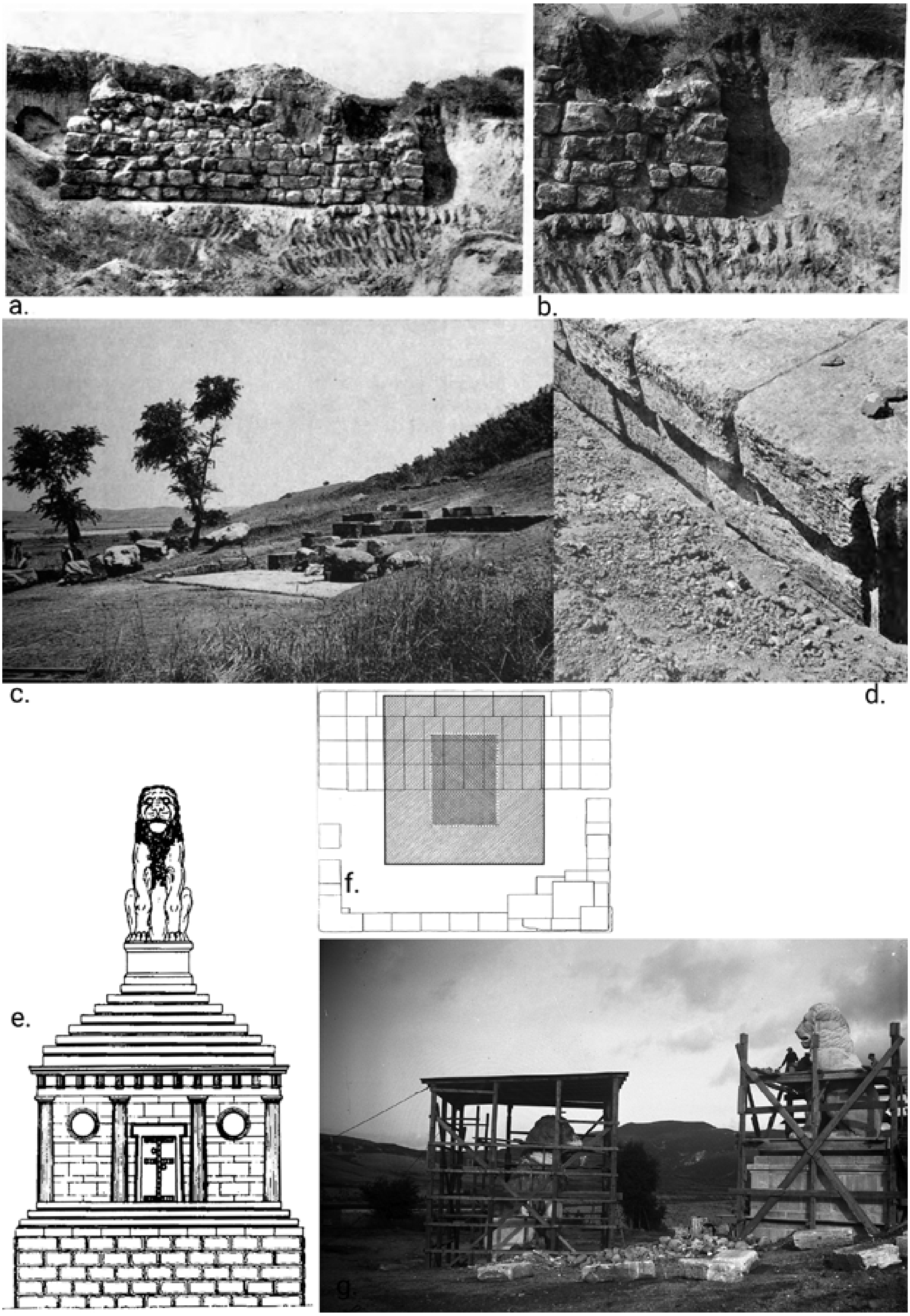

Figure 85. a-b) Base for a monument on top of Kastas mound (Amphipolis) (after Orlandou 1973: 44, fig. 34); c, d, f) foundation base for a monument found where fragments of the 'Lion of Amphipolis' were also discovered (Broneer 1941: fig. 6, 18, pl. V); e) reconstruction proposal for the 'Lion of Amphipolis' monument (Roger 1939: 37, fig. 19); g) image made during the reconstruction process of the lion monument in 1937 (Robinson 2013: 116, fig. 5).

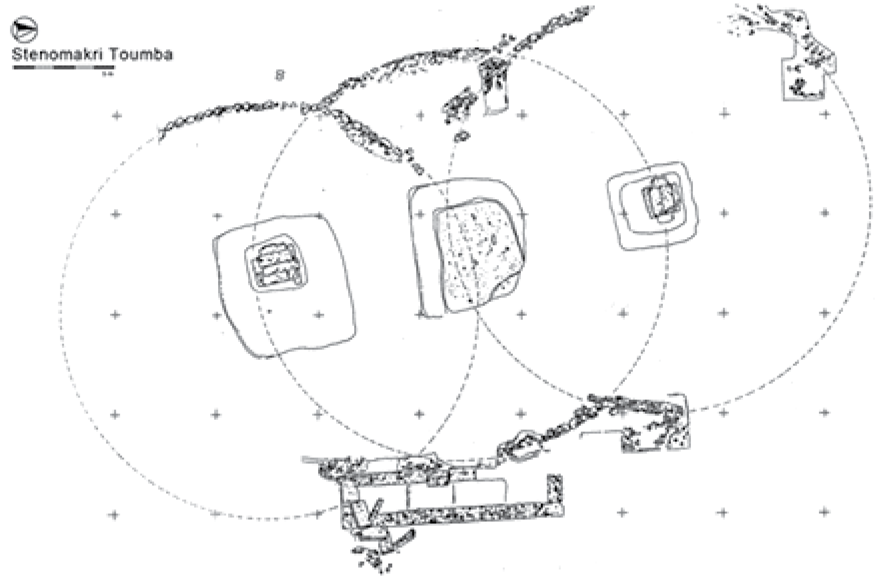

Figure 86. A stone base for statues and pyres serving a multiple tumulus complex at Stenomakri Toumba, Vergina, 4th c. BC (after Kyriakou, Tourtas 2015: 374, Fig. 13.14).

of Documaci in its western sector, near the road and area for offerings (Figure 86). They also show that the pairing of funerary mounds covering built chamber-tombs, or cists, with exposed statues or commemorative monuments placed on bases, some built as buried foundations, others placed at their peripheries, was practised in northern Greece in particular, but also in other cities where families of Macedonian origin lived, e.g. the island of Euboea. The mentioned examples belong to the end of the 4th - middle of the 3rd c. BC period (Stenomakri Toumba being probably the earliest, *c.* middle of the 4th c. BC).

A distinct trend that influences the funerary architecture of the communities entering into contact with representatives of Macedonian kingdoms, starting from the last quarter of the 4th c. BC, comes from Asia Minor and has older origins – the building of expensive, architecturally elaborated and richly decorated grave ensembles (individual or family tombs) that were obviously visible and ostentatious, e.g. the tomb of king Mausolus of Halikarnassos, the Nereid monument of Xanthos (Fedak 1990: 66), in Lycia, or the Heroon at Lymira (Șare 2013). These were temple-like tombs elevated on high podia – free-standing structures meant to be visible in their entirety, not covered by mounds.

At Cnidus, in Caria (Fedak 1990: 77), the base for the funerary structure was square, with sides of 12 m. It consisted of a three stepped *krepidoma* and a high socle. According to the excavators' reconstruction, the middle section was adorned with four engaged half Doric columns on each side. The upper storey was a stepped truncated pyramid supporting the Pentelic marble lion and its hollow rectangular socle. The lion, measuring 2.89 m x 1.82 m, weighed six tons. Inside the podium and pyramid there was a circular beehive chamber tomb with 11 funerary wall niches – indicating that the tomb was a family burial place. The entire structure measured *c.* 12 m in height, surrounded by a walled temenos and located on a preeminent peninsula overlooking the sea, 4 km from the city. It was clearly a landmark for navigators. The date of this monumental tomb is unclear. The arrangement of triglyphs in the intercolumniation has analogies with late 4th - early 3rd c. BC monuments in Cnidus, a date consistent as well with the employment of *loculi*. The use of engaged Doric columns might be a Macedonian influence, while the general architectural style resembles the Halikarnassus tomb of Mausolus. The eclectic style fashioned by these monuments was highly influential in the period, while freedom in experimenting remained a feature of the master architects designing these projects.

These monuments are significant, perhaps less for the understanding of how the *epithema* of Documaci could have looked, because they did not include tumuli in their designs, but more for the changes in the approaches to funerary rituals reserved for the wealthy and politically powerful individuals of those days, which meant more display.

For Documaci, an interesting parallel can be drawn, as an overall construction approach, not necessarily in terms of symbolism and function, with the recent finds from a colossal tumulus at Manole, in south-east Bulgaria. Here, in a mound measuring more than 120 m in diameter, a stone and brick construction, 20 m high, was found incorporated in the embankment, built from the base up, with the layers of soil supporting it from

Figure 87. A stone socle (?) in a tumulus excavated in the northern part of Callatis cemetery (after Sauciuc-Săveanu 1945: 253, fig. 7).

the sides. The structure, built in the style of a ziggurat, with the base larger, was probably a tower-tomb of the Early Roman period, similar to those found in the vicinity of Palmyra. Remarkable here is the adjusting of this exotic model to the local traditions in which monumental tumuli matter. The few finds at Manole, from several ritual pits located in the mound base, were dated in the 3rd c. BC. It is assumed by its excavators[3] that a statue could have topped the tower tomb.

Two brief mentions found in the older literature might suggest that Documaci was not in fact an isolated example at Callatis of a mound crowned by an *epithema* supported by a socle included in the embankment. A photograph published by Th. Sauciuc-Săveanu in 1945 shows that inside one of the tumuli he excavated in the northern sector of the necropolis, during construction of the railway from Balcic to Constanța, a cuboid stone structure of a certain height was found (Figure 87). No scale was provided, or description of the location, nevertheless the visual resemblance exists. The tumulus with a vaulted tomb, excavated by C. Preda (1962) at 2 Mai, south of Callatis, in 1961, was described as having a stone structure at its centre, now destroyed; it remains unresearched and unillustrated (see Chapter 3.4, T3 for more details).

Geological features of the central socle for a monument topping the Documaci tumulus

Valentina Cetean

In addition to the buried structures of the funerary complex and the walls built for protection, abutment or structural consolidation, the Documaci mound funerary ensemble also includes a structure of stone blocks measuring 4.94 m x 6.06 m and with a maximum preserved elevation of 5.53 m. Shaped as a pedestal, this was probably the base of an exposed monument topping the mound's centre (statue, altar, pillar), having supposedly a memorial purpose.

The stone blocks that form the structure share petrophysical features with the ashlars used to build the tomb, but of a smaller size in the most part. The thickness of the walls that create the pedestal is equal to the width of the limestone blocks, which vary between 50 cm and 70 cm. The interior structure, similar to a false foundation, was initially filled with a local loessoid-clay material and rock debris; over the millennia there were also several interventions to this material, either by individuals (e.g. searching for artefacts, stone extraction), or by preventive archaeological excavations carried out between 1993-1995.

Description of the constructive elements of the pedestal

The building elements used to raise the structure are parallelepiped limestone blocks (Figure 88/c-d). Although the shape of the blocks is geometrical, without considering the changes caused by the diverse subsequent natural processes, their sizes vary both in length and height.

More than a half of the visible blocks have straight angles between the top, bottom, and lateral sides. Most likely, the exterior side was cracked (the degree of flatness of the surface is relatively small), but some of the blocks appear to have been carved straight to give a more uniform appearance to the whole structure.

With very few exceptions, the arrangement of the blocks is made on the long side parallel to the ground, thus paying attention to maintaining a regular general appearance of the rows (Figure 76/e). Using the same principals as those used today in masonry construction, the block from the upper row sits across the two blocks over the lower row, having in mind the fact that there was no other binding material used. This was not an

[3] Kostadin Kisyov, Sophia Hristeva in FASTI (http://www.fastionline.org/record_view.php?fst_cd=AIAC_4844) (May 2019).

Figure 88. Socle, the northern face: a) example of alveolisation on AB corner dimensioned stone block row 8; b) biochemical weathering; c, d) degradation and alteration of stone: I – alveolisation, II - limonite deposition, III – loss of material; IV – biological crust; V - cracks (photos V. Cetean, Al. Teodor).

easy task, considering the fact that the blocks were of different sizes.

The problem of height difference between the stone blocks on each row was resolved by adding stone slabs (Figure 78), the largest one reaching 1 m in length and approximately 15 cm wide, but others were only 15 cm - 20 cm long and 7 cm - 10 cm wide (Figure 88/c). For the exterior sides, the presence of fragments with less regular shapes can be observed, but which were cut to size to fill the gap caused by the irregular shape of some of the blocks (Figure 78/b).

The importance given to the structural strength is best highlighted with the corner blocks of the rectangular construction. Considering all the identified petrographic varieties, for these maximum loading points, limestone blocks with the most compact visual appearance were used, most likely tested for their higher specific weights, corresponding to the highest apparent resistance. Even where blocks made of porous limestone were used, the general appearance is still solid. In addition, these corner blocks underwent supplementary processing, similar those found in Hellenistic geographical regions, i.e. a double L-shaped bevel or step-shaped chamfer, designed to keep a vertical edge (Figure 77).

Limestone is susceptible to undergoing acute transformation from weathering processes, whether from rainfall, colloidal solutions via the surrounding loessoid-clay soil, or from particular or longer exposure to wind (Hill *et al.* 1995). In the specific case of the Documaci mound funerary complex, the limestones from which the blocks were made underwent multiple, natural, physical-chemical processes. In fact, several factors contributed to the current appearance of the stone blocks of the exterior structure: a) the type and textural properties of carbonate rocks (which determine the durability characteristics); b) exposure to the natural environment (whether by being in contact with the covering material or deterioration and degradation from the effect of exogenous factors; c) the load the stone structure had to support (i.e. as a base for another constructive-decorative element).

The petrophysical characteristics of the limestone used as blocks for the structure

The research carried out during the project was aimed at both finding the varieties of limestone identified inside the site, as well as describing their specific characteristics.

The stone structure located in the area of the funerary complex, west of the tomb chamber, is made exclusively of limestone blocks, the petrophysical and mineralogical characteristics of which are very similar to those types of Sarmatian limestones found in the Limanu area (Figure 144). The general geological studies available for the area refer to several typological varieties of carbonate rocks, from bioclastic and oolitic limestones to calcarenite and algal limestones (Figure 31).

Their colours in consistent areas vary from white to dark-yellowish orange and light grey, sometimes with dark brownish or grey-yellowish shades, resulting from the secondary processes that tend to influence visual appearance.

Thus, 15 sub-types were highlighted through macro and mesoscopic analyses, together with optical mineralogical investigation, made in planar-polarized light. They were grouped in categories and named following scientific classifications (Hallsworth, Knox 1999) as follows:

- Extensive fossiliferous limestones (porous shell-limestone) – including *shell-limestone, biopelsparite* and *peloid-micritic limestone with bivalves*.
- Fossiliferous chemical precipitation limestones (limestones with a minimum of 10-15% fossil remains, but less than the previous subtype) – *peloid limestone*, *biopeloid limestone*, *micritic fossiliferous limestone*, *biomicrit*.
- Limestones genetically resulting from chemical precipitation – *lime-pseudosparstone*, *micritic limestone*, *microsparite-limestone*, *calcite-microstone*, *calcite-microsparstone*.
- Limestones with a higher content of clay mineral-calcite (*mud-grade limestone*).

Some of these types were more easily identified by direct observations and analogies with samples collected from the perimeter and analysed in thin sections under the microscope, as the sampling methodology did not involve taking fragments from the pedestal walls. The results showed that the main stone sub-types were from fossiliferous limestone and the compact limestone made by micrite and sparit calcite.

We also noticed a good overlap with the petrographic varieties from the tomb and the *dromos*, as well as with those from the *krepis*. However, due to diagenetic processes, i.e. calcification, blackening, limonitization (Figure 88/b), some of the limestones appear to have reduced specific information for mineralogical diagnosis of the subtypes by visual observation only. This, however, did not prevent us from determining the major geological unit to which they belonged, the numerous varieties of limestone being all specific to the Sarmatian deposits of southern Dobruja. Viable sources of stone found nearby are also supported by several geo-archaeological studies carried out for other Greek fortresses on the shores of Pontus Euxinos (Bîrzescu, Baltres 2013).

Alteration and degradation processes of the limestone blocks used to build the Documaci mound pedestal

Once rock is extracted from the area in which it is formed, it is subjected to physical and chemical processes (Mîndrescu *et al.* 2013), in addition to those already existing before quarrying. If the rock was extracted from the exposed side, it is likely that the new shapes of the stones (newly created sides after processing), different from the structural ones, will also exhibit new surfaces affected by joint actions of atmospheric factors (Vespremeanu-Stroe *et al.* 2013). However, if the rock was removed from the interior of the stone massif, its exposure will determine the beginning of a series of secondary processes until a state of equilibrium is reached in the new environment. The process can take place within a short period of time (Fort *et al.* 2006), but most likely it happened slowly, in an environment not exposed to direct anthropogenic activities, as at Documaci, which went on for two millennia. Usually this means the loss of material from blocks, but it can also mean additions, as the precipitation of calcite dissolved in aqueous solution from infiltration.

The main factors that contributed to the decay processes of the stone used for the exterior structure of the Documaci mound were exposure to weather conditions, such as water activity, wind erosion, thermal cycles (including frost), chemical alteration, salt crystallisation, and biotic activity.

Rain weathering. This is the most complex and intense process on the limestone. By its nature, the rain (less the snow) means both an environment for various other reactions and a factor for direct influence, modifying rock characteristics. The rainfalls are acidic due to their saturation in carbon dioxide (Siegesmund *et al.* 2002), thus causing a direct reaction with the carbonate rock, the resulting aqueous solutions supplementarily eroding or modifying on contact the rock at its molecular structure, be it matrix or carbonate compound, or allochems as fossil shells, or other type of lithic element. The process of dissolution of calcium carbonate caused by (unpolluted) rain is one of the most important factors in this case, even if it is linked with the geological, petrophysical and durability properties of the stone itself. Infiltrations are another factor to include here, from moisture or water reaching the soil, in which case absorption by capillarity will determine the extent of the process.

Wind erosion. This represents another important factor that influenced the aspect of the limestone used for the pedestal blocks at Documaci, taking into consideration also the geographical area in which the funerary complex is located. Southern Dobruja is exposed to significant air mass movements from several directions, to which can be added winds that are more or less local, due to thermic and day/night pressure changes near the Black Sea. Considering that the area is made of loessoid deposits, by their nature of erosional wind origin, the amount of material moved by wind, and with potential for abrasion, was probably high enough to change the surface of the exposed limestones in the original deposit. Another process related to this is the change in speed and direction of the rainfall influenced by these wind masses, the exposure of the sides thus altering and sometimes amplifying it.

Along with the salt crystallization processes, wind erosion has also contributed to the occurrence of alveolizations, mainly along the stratified plans. However, considering that all the blocks of the funerary complex were completely covered by the clayey material of the tumulus mantle, it is reasonable to think that winds only acted on the limestones in their source areas.

The thermic cycles. These determine the variation in the periods of stone heating, influenced by the sun, and with those of cooling, as a consequence of internal processes of expansion (growth) to a crystalline form. The amplitude (and permanent deformation) is determined by the internal structure of the rock. The higher their crystallinity, the more likely they are to be influenced by thermic cycles.

Alternatively, the effect of frost (and freeze-thaw cycles) on rocks depends on their mineralogical and petrophysical nature. Water collected in the pores of rock can increase its volume by as much as 9%; this may cause hydrostatic pressure, affecting both the internal and external integrity of the rock, which may begin to yield, starting from the opened cracks and pores.

Salt crystallization. This is a chemical process responsible for many changes that occur in the construction's parameters over recent historical periods, but at Documaci is due to the closeness to an intense saline environment, currently located 2 to 5 km east and south-east of the site. Fog, rain, and other forms of air movement can move salt particles from evaporated water from the sea. When in contact with the tumulus structure, these salts, in the moist solution, act upon the pores of soil and the cracks in the stone blocks. When drying, the water evaporates and the salts remain in the soil and rocks. As a result of the repeated drying and moistening of the salts (halite and gypsum in particular), the adjacent carbonaceous materials lose and receive water, which can cause increases in mineral volumes. Thus the rock will start to deteriorate, fragment, and ultimately disintegrate (Siegesmund *et al.* 2002). In other instances the salts will accumulate as efflorescence on stone surfaces, forming a white crust.

Biochemical weathering. This represents another process that can affect rock durability. It manifests itself via the accretion of different plant spores or microorganisms. In the case of the Documaci pedestal, it is visible in the growth of yellow lichens and various fungi (Figure 88/c) on the exterior sides; this does not, however, seem to cause any damage to the stone. On the interior sides of the structure, as well as in the larger gaps between the limestone blocks, plant spores or different bacteria probably developed, additionally causing oxidation or movement of iron minerals in the holes of the rock. It is most probable this was a recent secondary process, i.e. from the time of the first archaeological activities of 1993, when the pedestal was dismantled and has not been covered since.

Considerations regarding exogenous processes on the pedestal limestone

One geological issue resulting from the analysis of the pedestal, located to the west of the funeral chamber, was the identification and description of the limestones it was built from. Regarding the petrological carbonate nature of the rocks (through different subtypes) there was little doubt. But the secondary, and complex, phenomena of the processes of exogenous nature raised important issues that needed to be detailed within a geo-archaeological framework.

Most of the limestone blocks display clear evidence of prolonged contact with exogenous factors, common for carbonate rocks from geological deposits found in southern Dobruja. They show a wide spectrum (alveolizations, calcifications, black crusts, clay minerals depositions, limonitization, material losses, etc.), due to their petrophysical nature and its genesis, but also to the intensity of the various exogenous processes acting upon them (precipitation, wind, solar radiation, frost).

The geological investigation set out to identify how many of these degradations or transformations derived from the geological eras in their original locations from which the stone was extracted and used at Documaci, and how many were consequences of factors relating to archaeological excavations since 1993, when the structure was partially dismantled. To find answers to these questions and bring in as many scientific arguments as possible, the analysis had to include both the study of the geological material from the perimeter of the historical site, as well as site catchment analysis, i.e. the information gathered for the identification of the viable sources of the stone blocks used for the construction of the funeral complex.

The most important secondary processes identified on the limestone blocks from the pedestal structure are described below (Figures 88; 90).

Alveolizations were highlighted on more than half of the blocks of the northern side of the Documaci mound, corresponding with the bedding planes widening in this way the gaps which the stones had previously. The intensive process is dependent mainly on the rock structure, to which is added the action of the exogenous factors that induce differentiated disintegration with loss of material, from the deposition of limonitic minerals in the newly created spaces (Figure 88/a-b). From this one can notice changes in the initial compactness of the limestone blocks and increases in apparent porosity, as a result of capillary water absorption (from rainfall) on the enlarged surfaces. The size of the holes resulting from material loss can vary from centimetres to decimetres, causing a cavernous weathering appearance.

Limonitizations, visible as red-brownish coloured spots within the pedestal blocks, are mostly the result of the deposition of iron hydroxides from oxidation processes of iron-containing mineral from the soil of the surrounding area. The amplitude and specific characteristics indicate that these processes took place both in the area of limestone deposits from where they were extracted, as well as partly in the surrounding area of the historical construction.

For the source area, evidence comes not only from the presence of minerals in the form of slightly fragile crust, of sub-millimetre thickness, obviously associated with the dust-clay material that forms the soil of the area, but also from the holes of alveolization processes where the stone is exposed. In the area of funerary complex, the macroscopic and mesoscopic observations of some fossiliferous limestone blocks points to micronic sheets on the surface of bivalve shells or the closed pores of the limestone, thus indicating the development of oxidative processes soon after their accumulation (explained through variations in water levels covering the area during the deposition of carbonate material and by the presence of ferrous material in aqueous solutions).

Although it cannot be identified with high accuracy which area is responsible for the limonitizations of limestones or for the successive deposition of the hydrated iron minerals, their presence is noted on all exposed sides of the wall, in the form of a layer and/or pigments in the carbonatic mass (Figure 88/a, d). Generally, limonitization (especially goethite, a mineral from limonite mineral groups) is followed by subsequent calcifications and also by biotic processes (lichens, microorganisms).

The depositions of clay-size particles (less than 0.002 mm) and siltic-size particles (between 0.002 mm and 0.06 mm) in limestone holes are due to the leaching of the surrounding soils or winds carrying them. Depending on the volumes in which they adhered to the surfaces on which they accumulated, they influence the colour of those areas (darker in greater quantities). In some cases, the clayey material appears even in the content of the limestone (in which case its presence can be detected only via electron microscopy), however, this is due to processes during the formation of carbonate deposits.

The *white crusts* or *calcification* revealed on the surface of many blocks, or in some limestone holes, used to create the pedestal are linked to selective dissolutions of the limestone due to the effects of rainfall solutions with a slightly acidic pH (in the natural state, or due to the soil compounds that they have crossed), followed by depositions of carbonate layers. Microsparitic textures were occasionally seen, giving a glossy and compact appearance, or a micrite type texture, appearing chalky (dusty, and of a slightly spongy aspect, but obviously of a lime nature).

Usually the selective dissolutions covered the sub-millimetre cracks, thus indicating a subsequent formation of these fractures of the blocks. For some of the blocks, in the visible cracks, calcitic deposits were found as stalactite concretions, up to 0.5 cm long. In other cases, local sparitization (recrystallization of the micritic calcite, with the formation of crystals larger than 4 μ) gave a slightly more translucent and compact appearance to the limestones.

Flaking is a secondary process frequently encountered in the case of rocks exposed to the ongoing action of weathering and solar radiations, being related at some degree with material loss, as larger fragments, sand-size or dust-size particles. The natural conditions have not facilitated significant manifestations of rock exfoliation. Thus, the limestone blocks that form the mound pedestal were not supported advanced grinding for the straightening of the sides, the whole stone structure was covered for over two millennia by a clayey mantle, the area was never subjected to industrial activities that could generate specific chemical alterations and the usually dry climate didn't facilitate the stagnation of the infiltration waters for long periods.

However, it is not the case of loss of material through the physical process of granular disintegration or the blistering of stone that are frequently present and embodied both on the exterior surface of the wall, as well as in the linked areas between the blocks or their corners (Figure 88/b). This is mainly because the faces of the limestone blocks used in the pedestal construction were not carved, while the stone structure was never exposed to elements, but preserved inside the tumulus embankment for over two millennia, in an environment which did not facilitate the stagnation or the infiltration waters for long periods.

However, it is not the case of the stone material which was lost through the physical process of granular disintegration – the traces of which can be observed on the exterior surface of the wall, as well as in blocks' joints (Figure 88/b).

In places where the static load caused flexural and/or compression forces, the rock failed, especially at the edges and contact areas of the limestone blocks, and the material at these sites was crushed. The rest of the surface became areas exposed to limonitization, and liable to chemical alteration.

The formation of so-called *black crusts* or blackened pits represents another secondary process of stone at the place of final use, easy to recognize and different from non-cohesive argilizations. The studied limestone blocks are characterized by colour changes, namely by a crust of gypsum minerals of micron thickness, or even carbon accreted from the atmosphere, or clayey material attached to the uneven surfaces of the stone. As a result, the stone gets a darker hue, but is instead better preserved (Figure 88/b). Under specific conditions, these physical transformations are often accompanied by colour changes, of millimetre thicknesses, formed by ion-exchange processes between mineral compounds, or even by hydrated iron (III) oxide-hydroxides from solutions from the surrounding soil.

After the detailed description of the secondary processes identified on the pedestal's stone blocks, information was analysed from the mapping and sampling. The carbonate deposits that form the base of the area and the region (Figure 32) are often displayed on the slopes of the valleys that cross them. Such a perimeter is found on the northern slope of the present Lake Limanu, less than 2 km in a straight line from the Documaci mound, where a stone quarry was active for several decades in the last century (Figure 165). Very close to the quarry, historical remains were found in the Limanu cave, confirming the long human occupation of the territory. Other explored areas are located on the slopes of the valleys around Albești, Cotu Văii, and Hagieni.

The main detail noticed is the apparent similarity of the limestone from the archaeological site of Documaci, compared to others around the Lake Limanu area. Not only are the limestones of the area arranged in layers of different sizes, but they contain the majority of visual characteristics identified on the blocks from the pedestal. Depending on the mineralogical composition of the carbonate rocks, the effects of weathering varied from slight to very intense, limonitization having the highest visual impact (the leaching from the soil of iron-hydrolysed minerals), material loss (physical deterioration), and less calcite pseudospar secondary deposition.

Specimens for mineralogical analysis by optical microscopy were selected from the macroscopically and mesoscopically analysed samples. As a result, it was established that at least three petrophysical subtypes, of those identified from the tomb masonry, show similarities with varieties from the geological deposits found to the north of Lake Limanu (Mangalia). Hence, it can be concluded that the rocks suffered the most intense transformations under the influence of atmospheric factors at their original locations, which could partially be increased after the stone was processed for its intended use, i.e. blocks, slabs, or pieces for funerary structures. Most likely, some of the limonitization is due to soil contact and has induced the deposition of new crusts on the stone surfaces and holes, as well as various differentiated dissolutions, as calcitic layers or crusts of slightly more fragile appearance.

Additionally, a large number of blocks endured high erosion at the uncovered corners, but mostly where the stone cracked, sometimes along its whole thickness, as a consequence of the monument's weight (or other similar structure).

The newly created holes became open surfaces for depositions of various particles (limonite, calcite, gypsum), or localized fragmentation with material loss (Figure 88/b). Some of the secondary processes are new, obvious results of physical/chemical processes after the pedestal was built, and others have amplified the previous degradations. In addition to these are the apparent black crusts deposited on the surfaces of blocks from the lowest rows of the structure. The main cause of this is the prolonged period of exposure of limestones to moisture from the soil after the dismantling of the pedestal, which allowed water absorption, especially through capillarity. Contrastingly, the blocks from superior rows had more time to dry faster after rainfalls, which determined the changes of colour and depositions of clayey material from the filling of the stone masonry structure and from the mantle remains of the tumulus.

The effect of static loading on the pedestal's limestone blocks

The most notable physical process visible on the limestone blocks that form the pedestal of the

Documaci mound is the presence of cracks typical of loads under static stress (constant) (Figure 88/c-d). It is the most important evidence confirming the existence of a monument supported by this pedestal, located immediately west of the funerary chamber, in the centre of the mound.

Approximately half of the blocks have cracks with a thickness from millimetres up to hundreds of microns, only a small number of them are closed (filled), most are opened and have layers of calcitic depositions. Although the cracks are present on all four sides of the pedestal, the northern side was chosen for detailed analysis, including graphical representations, this being the most visible and intact wall surface as a whole.

In relation to the stone's strength under constant bending, the cracks were more present in the smaller blocks (10 cm - 20 cm), thickness clearly being the element of control. Even the thicker blocks of over 40 cm, placed in the area most exposed to the concentrated load, have caused this cracking, influenced also by the original texture of the limestone and its state of cohesion.

The overall analysis of the way the cracks are displayed shows a slight eccentric load to the west (Figure 90), their arrangement being obvious and the manifested area of the load influence at almost three quarters of the full length of the northern side (~350 cm). The blocks from the eastern corner are almost intact and, thus, the most evident correlations were made on the entire height of the central-western side.

It is obvious that someone unfamiliar with the behaviour of stone to bending/compression forces can miss many of the cracks, on the basis of the presence of the natural geological discontinuity, more precisely due to its natural process of genesis by sedimentation. But many similarities were noticed, based on several criteria, between the reaction of the stone blocks of the pedestal and various samples subjected to laboratory testing or to trial experiments. They firmly show that the cracks have resulted under the effect of a significant load, sufficient for the stone to have an irreversible physical behaviour.

Therefore, the shape of the blocks reflect at a macro scale the prismatic or the cubic laboratory specimens or cylindrically shaped ones (Bezerra *et al.* 2016). All types of extension and compression cracks that can occur were identified when the samples are subjected to bending and compression force: from shearing along a single plane or double shear, to axial splitting, cracking along the foliation, multiple fracturing, or even Y-shaped failure (Figure 90).

In several cases, the cracks were caused or amplified by the arrangements (overlap) of blocks in rows (Figure 88/d), their edges acting themselves as a trigger or critical points of manifestation for the load force. In other cases, the weight of the monument and the implicit resistance of the blocks caused cracks that continued on several rows, vertical and oblique ones being the most frequent (Figure 89/g-j; 90).

The research conducted did not include specific geotechnical studies. However, in order to have information regarding the size and weight of the monument that the rectangular stone structure supported, even if at a lower degree of certainty, analytical simulations were performed. For the beginning, it was selected the type of mechanical resistance method between the compression strength resistance and the resistance to flexural strength. Due to the fact the calculus for compression strength involves too many non-quantifiable parameters in this specific case, the simulation focused on the resistance to flexural strength method, as indicated by the specific norm (CEN - EN 13161: 2008).

In this evaluation, two hypotheses were used:

The analytical simulations were performed considering two hypotheses:

a) A massive limestone structure with sides of 4.94 m x 6.06 m and a height of 9 m, and an eccentric loading of 1 m to the west.b) A marble monument with dimensions of 3.50 m x 4.50 m (the loading points), with the apparent density of 2700 daN (kg)/m3 (Laskaridis, Perdikatsis 2009).

ü ,

from which resulted a formula for the weight (loading force) until a breaking point is reached for some constructive elements, i.e. F = (R x b x h^2) / l.

By generating corresponding values to some optimal situations, while respecting measurements and crack observations taken on-site, a minimal force was obtained of 450 kN, which, through mathematical adjustments, indicates a weight between 42-47 tons. This corresponds to a minimum height of 12 m for the monument on top of the pedestal.

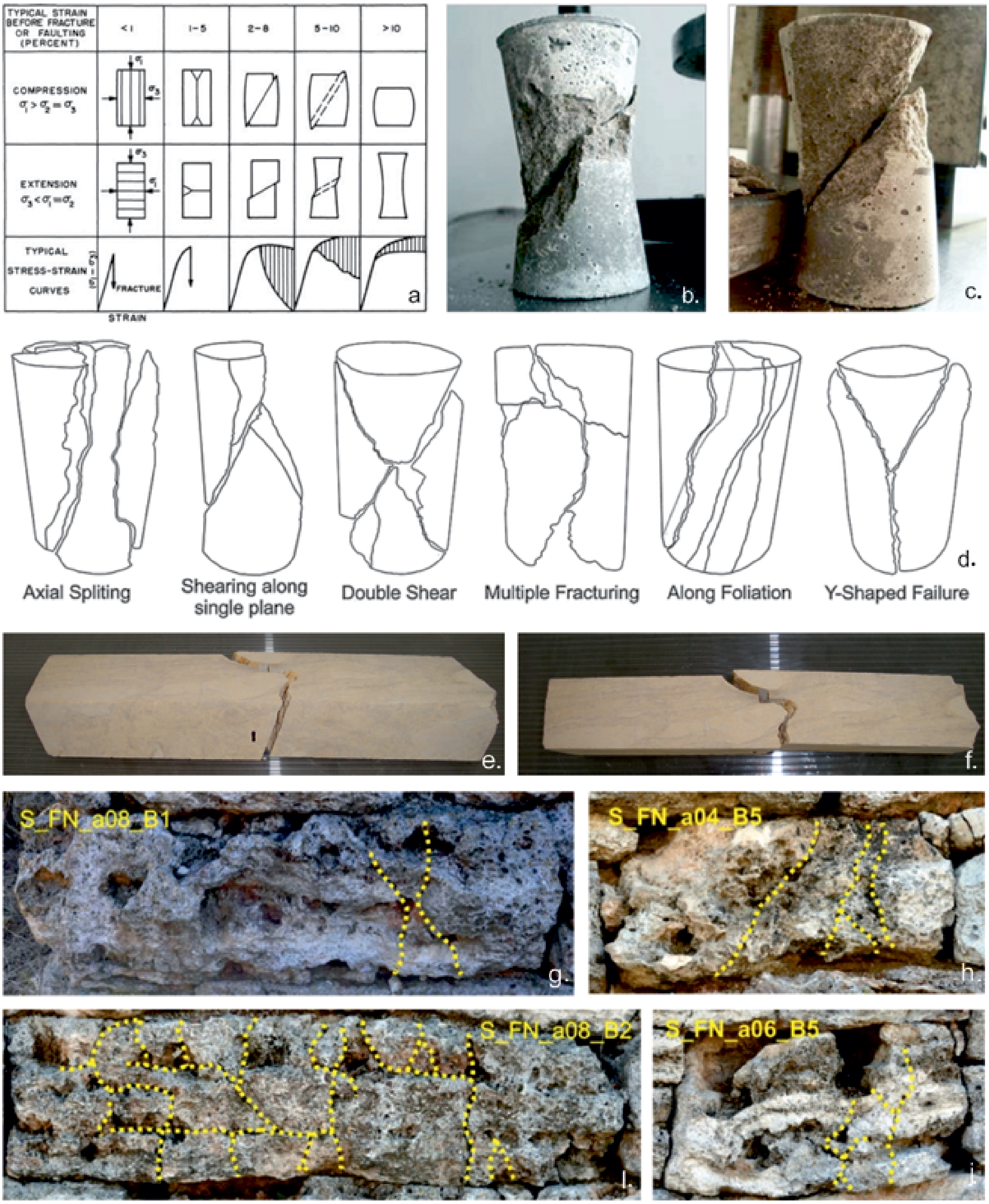

Figure 89. Cracks in the limestone (Bezzera *et al.* 2016; Cetean 2006): a, d) relation between strain and rupture processes; b-c) type of fracturing on concrete laboratory specimens; e, f) type of fracturing on limestone specimens; g-j) cracks in limestone blocks of the Documaci socle.

Figure 90. Socle, northern face: map of degradations and cracks due to the static loading.

Chapter 8
The Tomb

General considerations

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A single[1] burial structure – a built chamber tomb designed from the start to accommodate at least two individuals – has so far been identified under the Documaci mound. Unfortunately, it was discovered looted and partially dismantled since antiquity, both the interior and exterior. Almost nothing remained of the original funerary furnishings. The recovery of this tomb's story, significance, and chronology, starting with as little as its barren walls has been the project's most challenging research task, and, ultimately, all the recorded data, new or old, were called on to provide a context and perspective for this example of monumental early Hellenistic funerary architecture – rarely encountered on the western Black Sea shores. Chapter 8 draws on the various available sources bearing architectural, stratigraphic and petrographic significance, without exhausting, however, all the details recorded until now, nor claiming to deliver the definitive architectural account, as some segments of the structure were presented based just on the prior available documentation, unverified in a more recent survey, while other sensitive areas still remain to be excavated in the future.

The tomb is a carefully executed dry masonry construction of local limestone quadrae, located in the south-eastern quarter of the mound (Figures 34; 59). The entire ensemble, developed along an NNW-SSE axis, measured 22 m in length, being thus in a 1.2 ratio with the 26.4 m radius of the mound taken as an ideal circle.

It consists of a rectangular chamber (2.98/2.99 m x 3.589/3.59 m, 3.49/3.57 m high – interior measurements),[2] with plastered walls, painted in alternate bands using Pliny's traditional four-colour palette,[3] covered with a perfectly semi-cylindrical vault, built of carved wedge blocks (*voussoirs*), interconnected with leaded wooden clamps, and a long corridor (17.8 m long, 1.61 m -1.46 m wide) that ensured access directly from the margin of the mound's enclosure wall towards the interior. The chamber was laid transversally on the longitudinal axis of the *dromos*. The entrance into the *dromos* faced SSE (and the harbour of Callatis). The back wall of the funerary chamber is parallel with the long sides of the central socle, located less than 3 m away (2.6 m - 2.8 m), towards the north-west (Figure 75). The southern wall of the funerary chamber follows the same axis as the southern wall of the socle. This axis, if prolonged, crosses the opened area of the *krepis* in the north-western sector of the mound – the forecourt, where ritual offerings (*enagismoi*) were made, and it passed close to its median (1.3 m to the north of it). The socle structure is larger than the funerary chamber by approximately 1.6 times. Thus, the three main parts of the tumulus (tomb, socle, area for ritual offerings) reveal themselves as interconnected through an architectural and coordinated modelling of the funerary space, proving that the entire ensemble was based on the unitary design of an ancient architect who played masterfully with numbers and ratios.

If the *dromos* exceeded the *krepis,* like in the so-called Heroon at Archontiko (Pella) (Chrysostomou 1987), or if the entrance proper contained other architectural parts, e.g. a forecourt, we cannot know, as the eastern edge of the corridor was almost completely dismantled in the Late Roman period (5th-6th c. AD), for *c.* 8 m. For the most part of this destroyed segment, only the bottoms of the two foundation ditches excavated for the lateral walls, in previously heaped layers of the embankment, could be identified in the most recent trenches (S1/2017-2019, S8/2018-2019) (Figures 137; 147). The preservation of the lateral soil ramparts bordering the *dromos* walls on its exterior, in unaltered shape (Figures 140; 142), suggests that the looting targeted specifically the dressed stones, which were extracted along the walls. However this dismantling happened at some time after the tomb had already been reused, possibly as a dwelling, having the walking level inside raised. Obviously problematic is the fact that the recent archaeological excavations could not

[1] It remains to be seen over the next years if the geophysical resistive anomaly located between the socle and area for offerings in the north-west corresponds to a second tomb, or if it was just caused by layers of stone incorporated in the embankment.

[2] These values sustain the implementation of an ancient foot measuring 0.332 m (Broneer 1941: 23, 24, 28; endnote 22). The room would measure, thus, values very close to 10.8 feet x 9 feet, in a 1.2 ratio. At these dimensions, the chamber of the Documaci tomb occupies a place at the top end values for a large group of early Hellenistic barrel-vault tombs in Macedonia, Thrace and Greece, which share areas of 9 m^2 (18 ancient square feet) and above. In this group we find the other tombs of Callatis, T12 at Sboryanovo, and the tombs of Amphipolis, Kirklareli, Stavroupolis. The closest in dimensions are tomb D at Pella and the main chamber of Sveshtari-Ginina Mogila.

[3] Pliny, *Natural History* 35.32.

advance too much further east, outside the ideal *krepis* outline, in the entrance area, due to the existence of the protective dyke of the modern military facility – currently overlapping the site in that direction.

Nevertheless, despite its limitations, the stratigraphic context proves that the several limestone slabs identified in trench S8, at 7.8 m distance south-east of the concrete door blocking nowadays the entrance in the tomb (Figures 146; 144), and lying at the same absolute level as the pavement found in the ditch surrounding the *krepis* (in the northern and western sectors), might have belonged indeed to the pavement located in front of the *dromos* entrance, allowing therefore the assumption that the length of the corridor could be approximated with reasonable certainty. At this length, of about 17.8 m, the corridor would fit a *krepis* calculated on the ideal circle with a 26.4 m radius and a centre located at 60 cm south-east of the socle's geometric centre. These slabs also show that the entrance was located 30 cm above the walking level in the funerary chamber and 1 m beneath the walking level of the cemetery in the western sector of the mound (Figure 60). Adding to this, from the stratigraphic information available for the embankment surrounding the tomb (SII-SIII/1993-1995), and the results of the trial trench made inside the funerary chamber (S9/2018), it appears that the funerary structure was not of the 'cut and fill' type, but one raised from the ground up, simultaneously with the embankment.

The access corridor was made up of two distinct segments in terms of the roofing style and the treatment of the interior walls. The first 4.48 m of its length (or 13.5 ancient feet), calculated from the chamber towards the east, (labelled *dromos* I) were barrel-vaulted and finished on the interior in white plaster with a composition and layering technique similar to those documented for the funerary chamber (see Chapter 9) (Figures 126-127). At this length, *dromos* I is 1.25 m of the chamber long sides and 1.5 m of the chamber's short sides. The following *c.* 13.3/13.4 m (40.5 ancient feet) of the corridor (*dromos* II) – probably exactly three times longer than the first segment, remained unplastered, the massive ashlars built in *isodomum* style were less carefully carved, bearing rusticated surfaces, with the roof assembled as a row of pairs of opposing slabs (gable roof/saddle roof), fixed in an angular trench carved in the top blocks of the walls (Figures 129-131; 133). The walls of the first *dromos* segment were built interwoven with the blocks of the funerary chamber, with its central longitudinal axis perpendicular to the chamber back wall. The second *dromos* adjoined *dromos* I by a pair of double step joints fitted in the highest and lowest blocks of the first *dromos*, on each wall (Figure 128). These differences in construction style and the slight deviation (of 1°)[4] of *dromos* II from the main axis of the funerary chamber, towards the north, have been interpreted, ever since the tomb's discovery in 1993, as indications for the building of the tomb in a sequence of phases corresponding to the mound's enlargement.

As argued several times before in this volume (Chapters 6 and 7), this hypothesis also made it to our short list of mandatory research themes. The detailed study of the stratigraphy, based on the available data, mostly originating from the older excavations but also from newer ones, did not, however, sustain this interpretation in a clear and indisputable way. It rather hinted to a correlated building process of a series of composing parts, finished in a certain order by more than a single team of workers.

The interrelated dimensions in exact ratios of the three compartments of the tomb under the mound sustain the same unitary design, proving, for example, that *dromos* I could not have been any longer in an initial phase and then cut to fit a second, while the entire tomb structure relates to the tumulus radius in the same ratio as the walls of the funerary chamber, a value well known for numerous other Macedonian-type tombs also. Moreover, the deviation was not just for *dromos* II, but already in the eastern part of *dromos* I (Figure 125).

The mixing of various roofing styles in the composition of a single burial facility and the compartmentation of the access space leading to the chamber are not uncommon in Thrace and Macedonia[5] in the 4th-3rd c. BC, and the explanation is not always one of chronological sequencing.[6] The monumental funerary constructions were more likely, than other types of buildings, to have been highly individualistic creations, where variety and liberty in mixing styles were even sought.

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[4] The general plan of the tomb made by A. Sion, proposed a slightly larger deviation due to the fact that it considered *dromos* I as perfectly perpendicular to the chamber.

[5] For example at Kazanlak, in central Bulgaria, the funerary chamber was covered by a corbelled dome, the antechamber had a corbel vault, and the *dromos* was opened or covered with some light wooden roof (Mikov 1954). At Mezek the funerary chamber was covered by a dome, while the two antechambers and *dromos* had gable roofs (Filov 1937). At Naip (dated end of the 4th c BC - early 3rd c. BC), near Mt Ganos, the chamber was covered with a primitive barrel vault, while the *dromos*, assembled in two distinct sectors, was covered with a gable roof in the sector facing the tumulus margin, and with a flat roof for the descending sector approaching the funerary chamber (Delemen 2006). At Shushmanets (Stoyanov, Stoyanova 2016; Valeva 2018), the antechamber had a semi-cylindrical vault and the chamber had a dome. Many Macedonian-type tombs had opened wide and stepped *dromoi* in front of exquisite facades, built just of adobe, or simply carved in the bedrock (Miller 1993; Mangoldt 2012; Schmidt-Dounas 2006).

[6] In the cases of Sashova Mogila and Maglizh, both tombs under tumuli found around Kazanlak, the segmented *dromoi* were interpreted, however, as representing different construction phases (Stoyanova 2015: 163).

Figure 91. Funerary chamber, coloured plaster on the long walls (drawings by Fl. Marțiș (Mărcuți)).

At Documaci, both the chamber and *dromos* were initially paved with stone slabs continuing the upper level of the wall foundation plinths, placed directly on top of the mound's initial levelling of dark beaten clay. The floor in the funerary chamber was additionally covered with a thick layer of limestone plaster (3 cm -5 cm) (Figure 106). These floor slabs were broken during the ancient lootings, probably searching for buried valuables. The small trench (2 m x 1 m) S9/2018, we excavated in the north-eastern corner of the funerary chamber, revealed fragments of this destroyed floor scattered, together with pieces of marble, some burnt, coming probably from the funerary furniture, and parts of two dismantled quadrae, originally set in the middle of the chamber's northern wall, in the disturbed soil, as low as 50 cm beneath the wall plinths (Figures 107-108, 122/b). The high level of fragmentation of these stone fragments, and the depth of the treasure hunters'

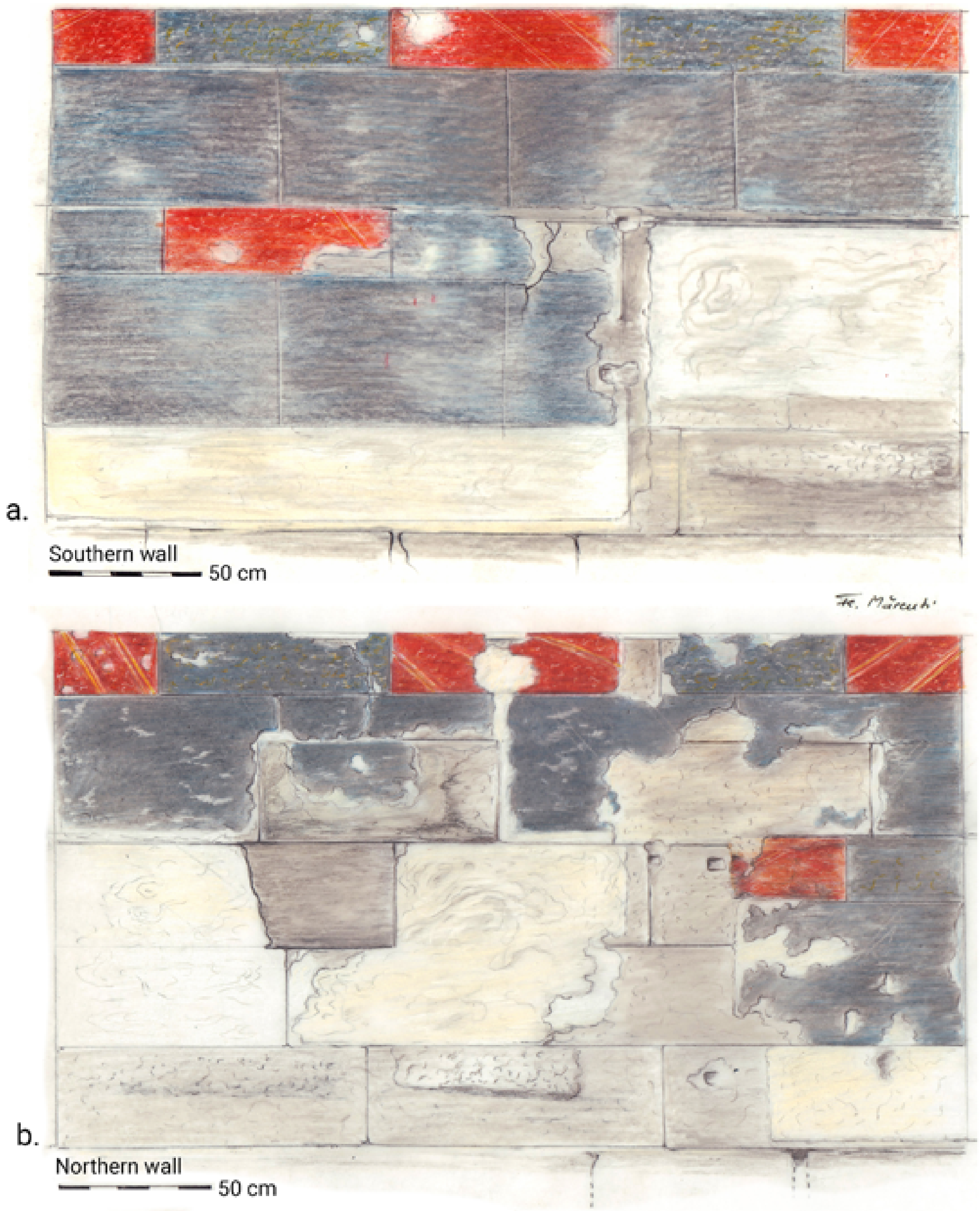

Figure 92. Funerary chamber; coloured plaster on the short walls (drawings by Fl. Marțiș (Mărcuți)).

excavation under the funerary chamber's floor, stand proof of the violence and systematic destructive approach of ancient looters. They probably expected the graves to be under the floor. It is known from other cases (e.g. the Mezek-Mal Tepe tomb in south-eastern Thrace; Filov 1937; Tzochev 2014) that secondary burials with their inventories could be positioned under the floors. Other discoveries, e.g. the chamber tomb at 2 Mai, had a pair of cists sunk under the floor level (Preda 1962). A sunken cist was also found at Amphipolis Kastas (Peristeri 2016).

Several larger fragments of marble (one with the oculus of a volute, two carved with different varieties of egg-and-dart moulding, and others representing plates with drafted margins of two different widths) all bearing traces of red paint (chess pattern, colour block and meander), were found in the chamber during Georgescu's early excavations (Figures 117-119). They were interpreted then as parts of the doorway *encadrement*. More recently, starting with some observations made by Alexandra Teodor, these are now believed as more probably originating from the destroyed *kline*-like furniture. It is not clear where exactly in the chamber Georgescu found the marble plates. In general, the information regarding the archaeological excavations inside the tomb, during 1993-1995, remain thin and contradictory. We believe that during the archaeological investigations of these years only the soil accumulated inside throughout antiquity was removed and no dig was made specifically beneath the level of the wall plinths. The incomplete reporting of plinth thicknesses in A. Sion's plans sustains their unavailability at the time. Moreover, in trench S9 we find no traces of any former archaeological trenches. The dirt impregnated in the tomb's plastered walls from the floor up, suggest that the thickness of this deposit was *c.* 1 m. The source of the soil should be associated with the destructive activities in the entrance area in the 5th-6th centuries. The high position of the early medieval graffiti on the walls of *dromos* I also sustains that by the 10th c. AD (Figures 169-170), soil was already accumulated inside consistently. Informal reporting concerning the Georgescu excavations maintain that the soil extracted from the funerary chamber was sieved; this is how the gold ring (1 in Chapter 13) was apparently identified.

The doorway is a slightly trapezoidal opening, with tapering walls, from 1.19 m at the base to 1.12 m beneath the lintel (Figures 124; 122). It measures 57 cm deep, and 2.01 m high above the bare plinth of the lateral walls. The access was made over a threshold block fitted between the doorway walls before their plastering, placed directly over the wall plinths. The threshold was itself plastered on the side facing the funerary chamber (Figure 123). It was found in a slightly displaced position, leaning towards the *dromos*. Trench S9 showed that a second looting pit, associated with a more recent event than the one that had initially dismantled the chamber floor, was dug right under the threshold, as deep as 1.5 m. The threshold block must have been pushed with a crowbar, or similar, to make room for the treasure hunters' pit. The plain, one-piece lintel had no holes for fitting the metallic elements of a door, on either of its faces. Two small rectangular orifices were noted at the middle and upper heights of each of the lateral sides of the doorway, closer to the margin facing the *dromos*. Fragments of metal can be still observed inside. They might perhaps accommodated a light, two-leaf wooden door. The parallelepipedal threshold block was carved with a narrow step towards the *dromos*, which at the lateral ends, even if chipped, revealed two rounded depressions (Figure 123/c) that might also have been connected with the pivots of some kind of double-leaf door.

The defining elements of the architectural model employed in the tomb built under the Documaci mound (i.e. perfectly semi-cylindrical vaults of carved *voussoirs* fitted with leaded clamps for the funerary chamber and the first 4.48 m of the corridor, the well-executed dry

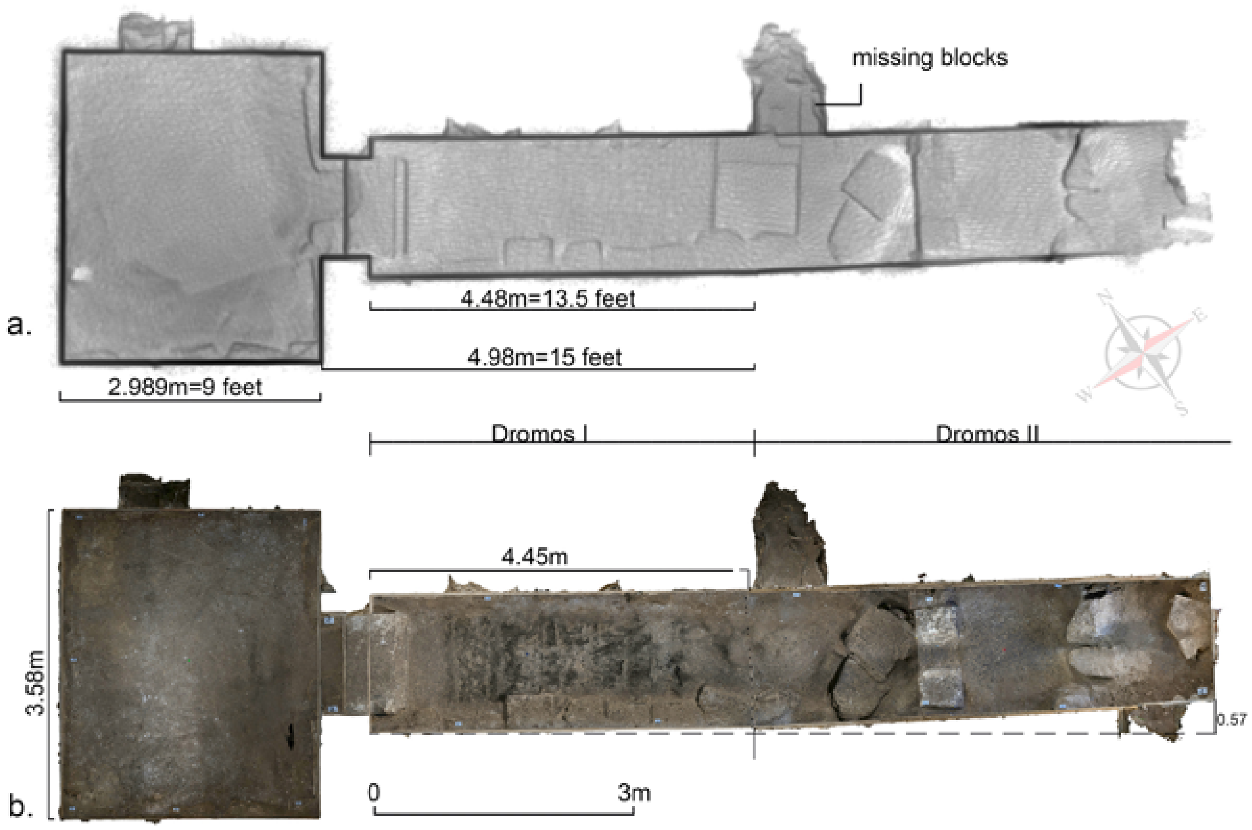

Figure 93. Tomb plan, horizontal sections: a) cloud point obtained with GeoSlam portable 3D Scanner with Lidar sensor (by D. Ștefan); b) textured photogrammetric 3D model (by C. Șuteu).

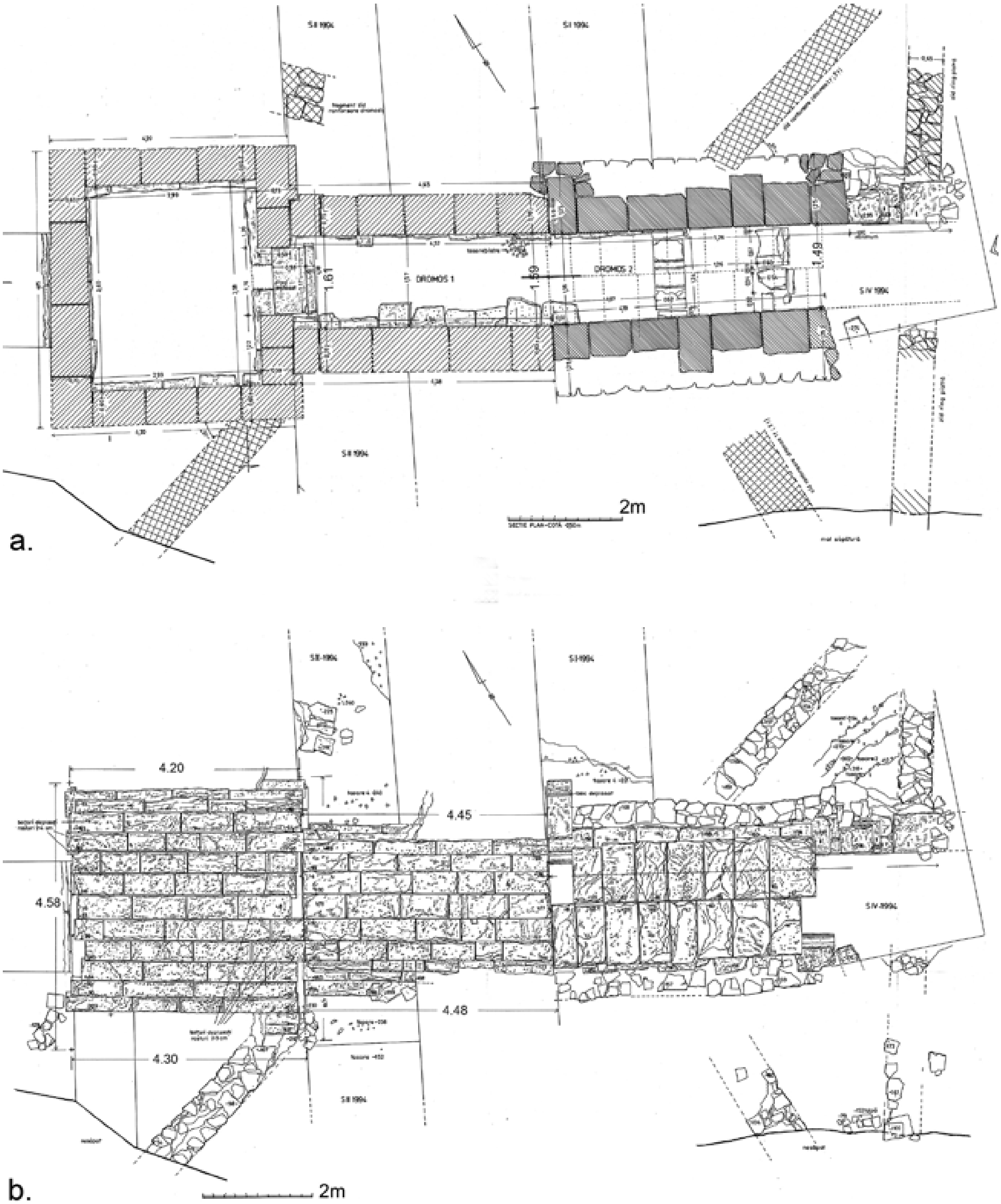

Figure 94. Drawings by the architect Anișoara Sion (1999: pl. III, IV), based on measurements (by hand and with alidade) from 1993-1994. Even if the more recent digital documentation activity in the tomb revealed a variety of differences between the tomb's interior and Sion's documentation – e.g. in block dimensioning and the numbers per row (as the plaster fell away over time, revealing the joints more clearly), or in the general angles of the compartments – these drawings are especially valuable for the *extrados recording*, which has never again been uncovered since. The section (a) was made along the third masonry row (numbered from bottom up).

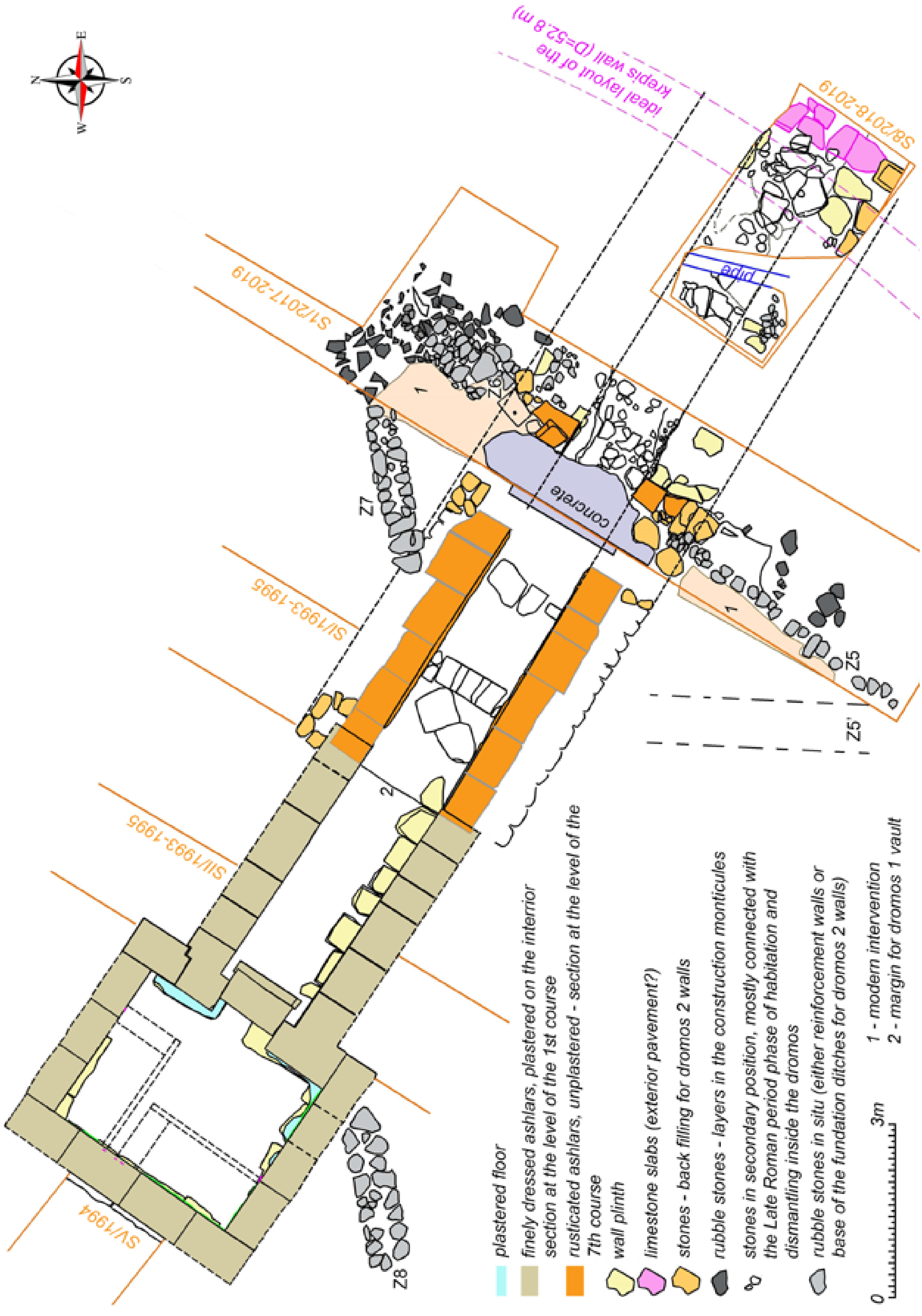

Figure 95. Tomb plan; composite horizontal representation integrating multiple section depths; data extracted from various sources (Figures 93-94).

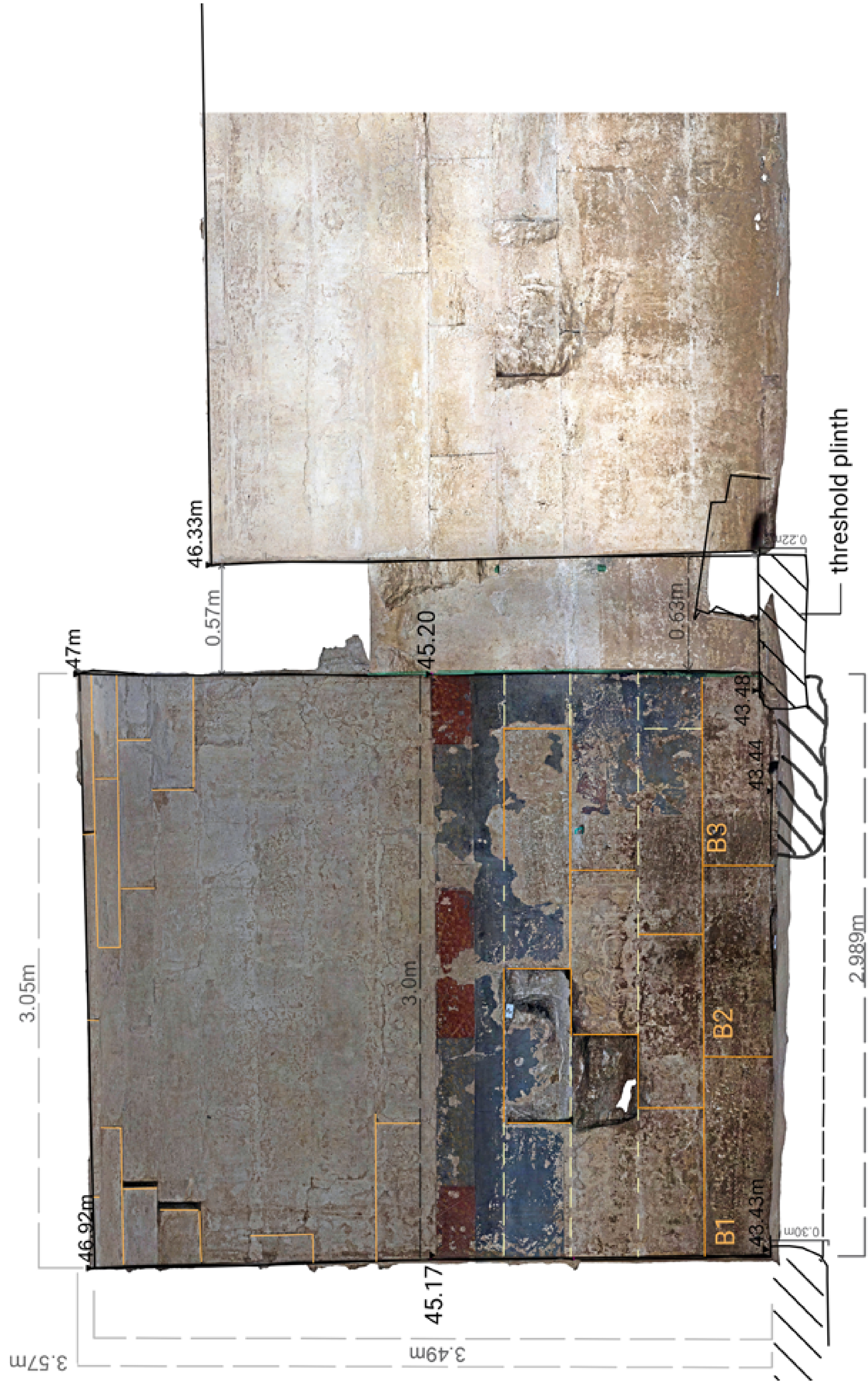

Figure 96. Northern wall of the funerary chamber and part of *dromos I*, main geometry elements and absolute elevation measurements; enhancement of visible joints.

Figure 97. Southern wall of the funerary chamber and part of *dromos I*, absolute elevations.

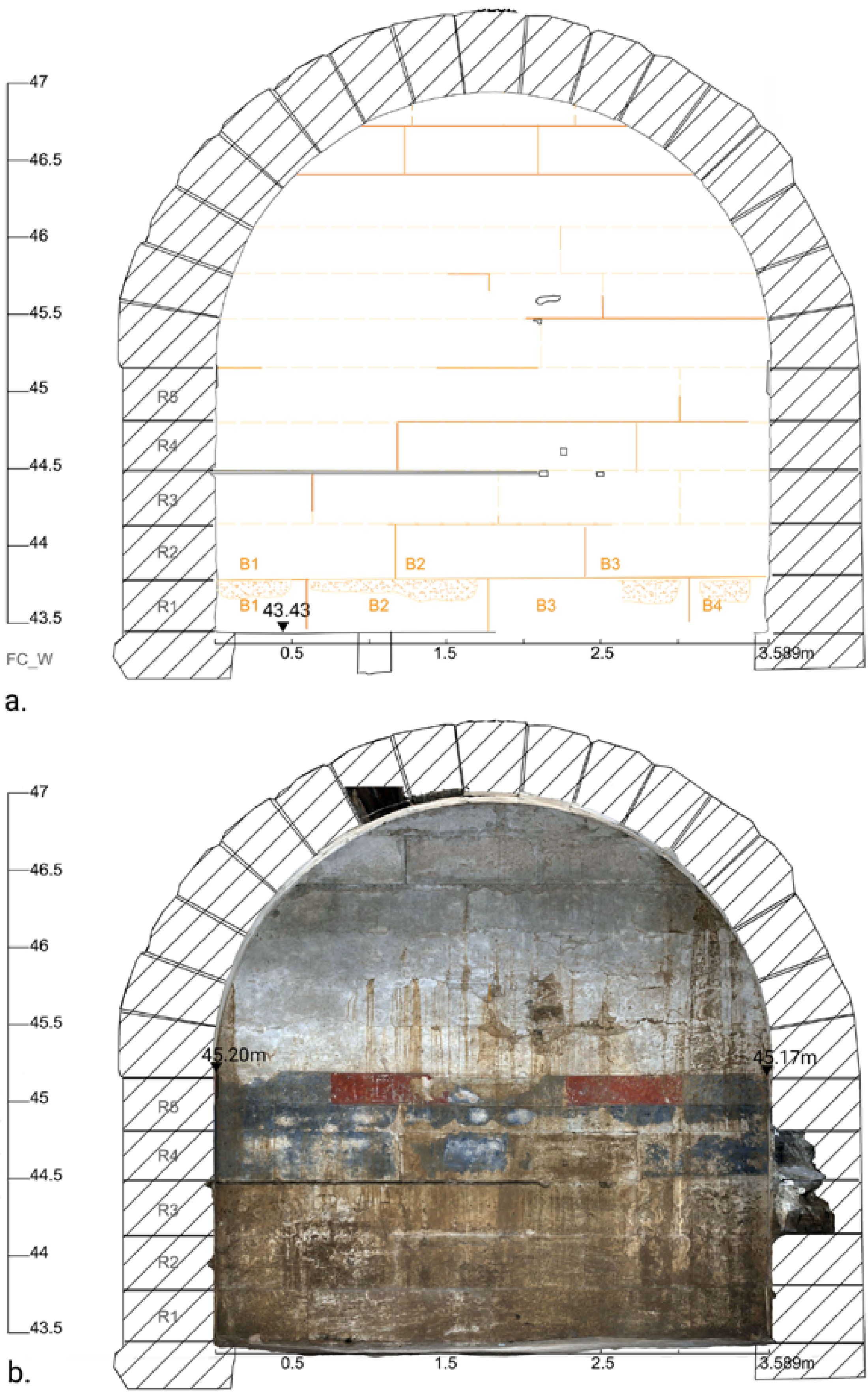

Figure 98. Funerary chamber western wall. Wall thickness based on Sion's recordings, partially corrected based on photogrammetry, when data allowed: a) visible ashlars' joints; b) orthophoto.

masonry in *isodomum* technique, the austere decorative style of the funerary chamber painting, mimicking masonry and marble with plaster and paint, the use of a pair of *kline*-like furniture arranged in 'Γ' formation, among which was a *kline*-sarcophagus, from which only the wall imprints had remained and some scattered fragments of the marble plating) allow the inclusion of the studied ensemble within the series of Macedonian-type tombs of the early Hellenistic period, in particular within the category of those that lack facades. Even if the referenced techniques and designs belong to the wider early Hellenistic cultural milieu that spread over three continents, the closest analogies as an overall model (for the architectural composition, *kline* with lids fixed in horizontal grooves carved along the walls, masonry with corner blocks belonging to two adjacent walls, theme and colours of the painted plasters) come from the area of eastern Macedonia, and, in particular, from Amphipolis.

Several other constructive features, like the designing of the access with a minimum sinking of the funerary chamber floor (of just 30 cm), the assembling of the tomb directly over the ground, not in a pit, the pairing of a chamber with a long *dromos* and the use of the gable roof in the eastern sector of the *dromos*, represent less common features for tombs built in northern Greece at that time, although not totally unaccounted for, bringing the structure at Documaci close to the category of so-called 'hybrid' tombs, in which those architectural elements more often encountered in Thrace were also identified (Delemen 2006). More than Thrace, however, some of these hybrid techniques could be rather of Olbitan origin (Figure 132), especially the use of the gable roof and the particular technique whereby *dromos* II was fitted with slanting roof slabs in an angular groove carved in the highest blocks of the lateral walls. At Olbia, six cist-tombs with gable roofs had the same grooves for supporting the roof slabs; they were dated from the second half of the 4th - 3rd c. BC (Papanova 2006b: 115-117, fig. 47.2, 48.1).

Masonry in the funerary chamber

Alexandra Teodor

Relations between walls of the funerary chamber

The fortunate preservation of the plaster layer has the downside of not allowing the investigation (with the technologies available to us)[7] of the masonry configuration behind it. So far there are only a few hints offered by the careful on-site analysis[8] combined with the pattern analysis of the blocks on each wall (see below). A further, more in-depth verification will be useful, but only by non-invasive techniques.[9] The corners of the walls were built of intercalated blocks.

The situation recorded on-site is as follows:

Northern wall (FC_N):

The eastern part/extremity of the wall is entirely covered with plaster.On the first course, c01_B1 is attached to the adjoining block on the western wall (FC_W, c01[10]_B4), which continues behind c01_B1.

For the second course, c02_B1 enters behind the adjoining block on the western wall (FC_W, c02_B3).

All the upper courses are covered by plaster.*Southern wall (FC_S)*

The eastern part/extremity of the wall is entirely covered with plaster.On the first course, the corner block (*c01_B3?*) is attached to the adjoining block on the western wall (FC_W, *c01_B1*).

For the second course, which is not entirely covered with plaster, the corner block enters behind the adjoining block on the western wall (FC_W, *c02_B1*).

On the third course, the corner is covered with plaster. On the fourth course, at the bottom of the blocks (visible in the horizontal cut made for the furniture, at this level) a cavity can be observed; the latter could indicate either the presence of two joined blocks, or just a cavity related to stone working made in a larger block.

The stereotomy of the interior elevations

Northern wall (FC_N)

There are five courses of stone blocks (numbered from c01 to c05), measuring 1.7 m in height, above which the vault begins (discussed separately, below). Three of them, c01, c03 and (most likely) also c05, are clearly made from three large blocks each (all *c.* 1 m in length), while c04 has four blocks; for similarity with c04, course c02 could also be built from four blocks, but the plaster covering makes this hypothesis unverifiable as yet. However, it seems that the pattern of the blocks for the

[7] A survey with Infrared Thermography (Zenmuse XT2 Dual Sensor Thermal Imaging Camera) provided no relevant data due to the high humidity of the walls and plaster.
[8] The observations were made by the author of the current section. The architect Teodor Bănică also had some notes in October 2018 on the interior walls of the tomb, however only small parts of them were integrated. References will be made where applicable.
[9] On occasion, researchers choose to sacrifice plastering so as to understand the masonry behind it; normally, this would only be acceptable if prior to this it was determined that the respective plaster was of no considerable value. It is not the case here, where the entire plaster with its decoration seems to have only a single phase – the initial one.
[10] Editors' note: this is referred to as row 1 elsewhere in this study; thus, course (c) and row (R) should be taken as interchangeable.

Table 6 The Funerary Chamber, Northern Wall (FC_N), direct measurements

Course_Block	Length (cm)	Height (cm)	Observations
c01_B1	102	36	
c01_B2	96	36	
c01_B3	101	36	
c02_B1	75	32.8	continues behind FC_W
c02_B2	87	33	
c02_B3	135?	32.5	? (could be two blocks) / could continue behind FC_E
c02_B4?	?		
c03_B1	114	33.5	Incomplete/dismantled (broken length)
c03_B2	83	33.5	
a03_B3	103	33.5	could continue behind FC_E
a04_B1	67.8	33	
c04_B2	78.5	33	
c04_B3	122	33.5	
c04_B4	30.5	33.5	could continue behind FC_E
c05_B1	?	34	
c05_B2	?	34.2	
c05_B3	99	34.2	could continue behind FC_E

five courses could be (from base to top): 3 – 4? – 3 – 4 – 3, or, less likely, 3 – 3? – 3 – 4 – 3.

Summing up, the total number of blocks on the northern wall could be 16 or 17, and they are all rectangular prisms.

The heights of the courses (implicitly, of the blocks) are more or less similar and vary between 32.5 cm and 36 cm, with an average of 33.9 cm; the highest is the base course (c01), while the shortest is the second course (c02). The lengths of the blocks are significantly diverse, with a variation between 30.5 cm and 122 cm, although most are well over 60 cm long, so that their cumulative length on each course reaches 3 m. Each course has at least one block longer than 1 m.

In comparison with the situation recorded in the drawings of Anișoara Sion, several differences emerged: (1) regarding the heights of the courses, only one row (c03) was reported to match our measurements, while for the rest of four there are differences between 2 cm and 6 cm; (2) the number of blocks per course was only verified for two rows (c01 and c05), while for the others we found fewer blocks, thus longer dimensions for some of them. The lengths of the blocks were largely verified for c01, while for c05 they can only be presumed to be similar with the blocks of c01. For the rest of the courses the lengths of the blocks can also be verified with insignificant differences – except for when one block was represented as two (c03_B1, c04_B3), or possibly two as three (c02_B3). The significance of these differences is, after all, that in the situation presented by A. Sion there was apparently no rule in the stereotomy of the wall, while our observations indicate a possible pattern (see above).

The southern wall (FC_S)

The plaster coverage on this wall is much more extended compared to the northern wall, thus the limits of the blocks are visible for only a few of them. Accordingly, there is no certainty regarding the number of blocks for any of the courses. However with the data currently available, the possibility for sharing with the northern wall a common schema (3 – 4? – 3 – 4 – 3) remains open. The blocks here are also all rectangular prisms.

Only the first three courses (c01-c03) could be measured on their heights, which vary between 33.7 cm and 35.5

Table 7 The funerary chamber, Southern Wall (FC_S), direct measurements.

Course_Block	Length (cm)	Height (cm)	Observations
c01_B1	105?	35	conjectural, based on a crack in the plaster below the joint on ac03
c01_B2	?		only one edge visible,
c01_B3?	?		
c02_B1	?	35.5	covered by plaster
c02_B2	?		covered by plaster
?	?		if similar with N wall
c02_B4?	59		
c03_B1	104?	33.7	deduced for total wall length of 300 cm
c03_B2?	87		
c03_B3?	109		corner covered with plaster
c04_B1	?	?	covered by plaster
c04_B2	?		covered by plaster
?	?		if similar with N wall
c04_B4?	61		joint visible below the slit; runs behind FC_W
c05_B1	?	?	covered by plaster
c05_B2	?		covered by plaster
c05_Bx	127.5?		the only vert. joint visible

cm. These heights do not perfectly correspond to the situation at the northern wall, as there are differences of nearly 2 cm (c02).

From a total of *c.* 16-17 blocks (if similar to the northern wall), the lengths of only seven could be measured, varying between 61 cm and 127.5 (?) cm, thus with the maximum value close to the longest recorded block from the northern wall (122 cm, c04_B3).

The disposition of the blocks in A. Sion's drawing is 4 – 3 – 4 – 4 – 3?, but with too many uncertainties or elements erroneously presented as certainties. For instance, the only firm vertical joints marked on courses c02 and c04 are surely wrong, as the traces indicated correspond once with the carving within a block for fitting the furniture (c02), and in the second case with a limit line between the painted panels (which are not necessarily the same with the limits between the blocks).

The western wall (FC_W)

The western wall of the funerary chamber extends to 11 courses. Conventionally, we will consider this the lower part of the wall. The rest of the six courses correspond to the semi-circular vault; and we can consider this the upper part of the wall. Only the blocks of the lower part were measured on-site, while the remainder can be approximated on the orthophoto. For the lower part of the wall, the shape of the blocks is also rectangular prismatic, as with the adjacent walls. Contrastingly, for the upper part of the wall all the side blocks (and the entire upper course) were cut and carved to fit under the vault. Geometrically explained, the shapes of these blocks result from cutting a rectangular prism length with a semi-circular surface having the radius of the vault, thus yielding a rectangular prismatic block with a curved lateral face. In this wall there are approximately 25 rectangular prismatic blocks and 10-11 rectangular prismatic blocks with a curved side face. The block(s) in the upper course is (are) the result of a similar subtraction, but instead of one side cropped there are two (if there are two blocks on the course), or even three (if there is only one).

With a high probability, the disposition of the blocks within the courses of the lower wall uses the same pattern as the ones very likely used for the northern and southern walls (now even more), although with a switch (the pattern starts with 4 instead of 3, but these walls are slightly longer here – 3.6 m instead of 3 m): 4 – 3 – 4 – 3 – 4?

This pattern becomes a key for understanding the coherence of the building system. The only uncertainty is for the fifth course (c05), where it is not visible whether there are three or four blocks, but based on the determined pattern it is presumable that there are four.

For the upper part of the wall the pattern may have continued for up to another five courses, even though the length of the wall is gradually reduced to fit under

Table 8 The Funerary Chamber, Western Wall (FC_W), direct measurements.

Course_Block	Length (cm)	Height (cm)	Observations
c01_B1	>59.6	34.5	continues behind FC_S
c01_B2	118	35	
c01_B3	135?	34.5	
c01_B4	>52	36	continues behind FC_N
c02_B1	116.5	?	possibly common with the adj. FC_S
c02_B2	122	?	
c02_B3	>120	?	possibly common with the adj. FC_N
c03_B1	>63.4	33.4	continues behind FC_S
c03_B2	120.8	33	
c03_B3	120.5	33.4/33.5	with carving
c03_B4	>55	?	possible to continue behind FC_N
c04_B1	119	30.8	
c04_B2	153.8	30.5/33	with partial carving
c04_B3	87.5	33.2	
c05_B1	?	?	
c05_B2?	?	34.7	
c05_B3?	146	34.5	
c05_B4?	59.7	?	

the vault; however, further on-site verifications need to be before this observation can be confirmed.

For the lower part of the wall, the measurable heights of the blocks vary between 33 cm and 36 cm, except for the blocks carved for fitting the furniture, thus having in some parts heights of *c.* 30.5 cm. The maximum height of the western wall is *c.* 3.5 m (based on total station measurements).

The lengths of the blocks were possible to determine for most of the blocks, except for two, which are almost entirely covered by plaster, and a few others (four to six) that are probably longer than we can see as they continue behind the northern and southern walls. Therefore, except for the end blocks (where the visible lengths vary between 52 cm and 120 cm), the lengths of the measured blocks that are entirely visible vary between 118 cm and 153.8 cm, with an average of 130.9 cm.

In A. Sion's drawing, the pattern of blocks is presented in a similar way to that described above for the first six courses, even if the limits of the blocks are not always where indicated. For the upper five courses, however, the situation presented (in fact, presumed) is slightly different: 3? – 3? – 4? – 3? – 3? – 3? (A. Sion), instead of 4? – 3? – 2/4? – 3 – 3.

The important differences may come from the significant degradation of the plaster, particularly for this wall, thus offering us today more indications of the size of the blocks compared to the situation 25 years ago.

The eastern wall (FC_E)

The special feature of the eastern wall is that it contains the entrance to the funerary chamber. This wall was built from 10 courses, rather than 11, like the opposite western wall.

At least up to the fifth course inclusively (thus, the lower part corresponding to the northern and southern walls) there is a good chance for a repetitive pattern:

1/2? – e – 2 // 1? – e – 1? // 2 – e – 2 // 1? – e – 1? // 2 – e – 2,

i.e. alternating one or two blocks on each side of the entrance; then the pattern is lost for the upper courses: 2 – e – 2 // 3 // 3? // 3? // 2.

In this wall there are up to 21 rectangular prismatic blocks (but possibly much less, perhaps only half), eight rectangular prismatic blocks with one curved side face, and two rectangular prismatic blocks with two curved side faces. Notably, some of the corner blocks in the lower part of the wall (courses 01 and 05) towards the entrance and *dromos* I are common with the adjoining blocks.

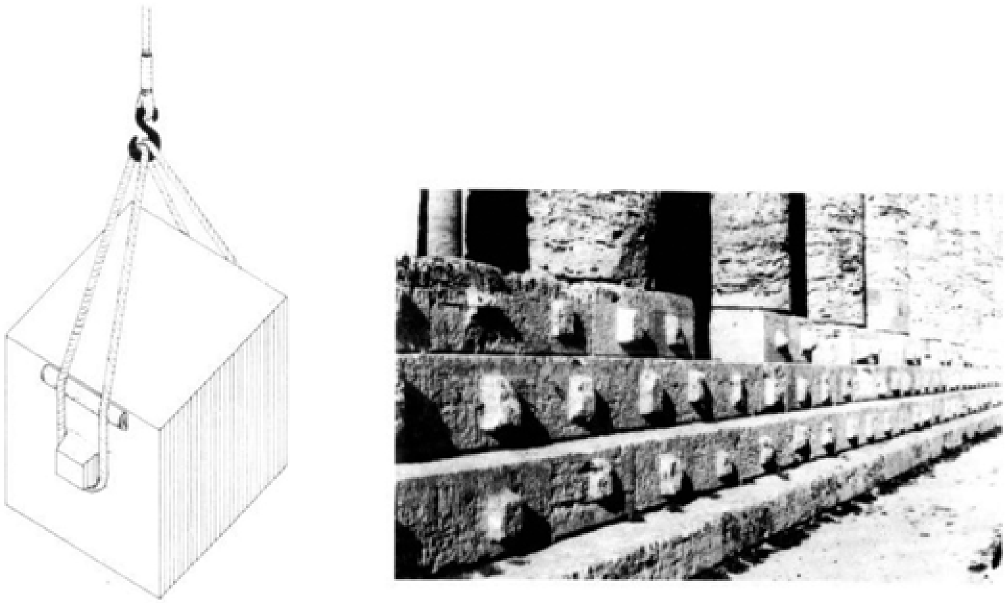

Figure 99. Segesta (*stylobate*) (after Ginouves, Martin 1985: pl. 33, Figure 1, 6).

The heights of the blocks (and, implicitly, of the courses) are similar to those of the other walls, except for the course above the entrance (c07), the one containing the doorway lintel, which is about 10 cm higher than the rest (43-44 cm), and, perhaps, also some of those above (unreachable), in order to compensate the one course difference mentioned above (which means over 30 cm). The maximum height of the eastern wall is *c.* 3.58 m (based on total station measurements), thus largely the same as the opposite western wall.

Not much relevant data is available for the lengths of the blocks, for several reasons (plaster covering, unreachable height, etc.). Obviously, for the lower part of the wall the lengths of the blocks are less impressive, compared to all the other walls, because of the entrance. Therefore, most of the measurable (visible) blocks are *c.* 70 cm to 85 cm long, except for the large block above the entrance. The lintel (c07_B2), besides being 44 cm high, measures up to 169 cm long, thus being the largest block within the entire structure of the walls. This is to be expected for a block that had to support the greatest load of all.

For this wall there are no significant differences between the situation presented by A. Sion and the one recorded by us, at least in terms of the number of blocks per course, even if the position of the joints was reported erroneously at times.

Dressing particularities of the building blocks

The entire interior parament was ultimately covered either by plaster or furniture, thus the details described below were never to be seen. The parament covered by plaster was most probably prepared precisely for this purpose (to be a plane and adhesive support for the mortar layers), while the rest – hidden by the furniture – mattered even less.

The treatment of the interior face surfaces is not unitary for all the blocks (see further, Chapter 8.9 for an inventory). Two largely different situations were recorded: (1) blocks with protrusions in the first course; and (2) a common treatment of the blocks in the upper courses of the walls involving a very fine dressing (the same treatment applied to the blocks of the vault will be presented in the following section). The common treatment of the blocks in the upper courses of the walls exists in two recurrent situations recorded so far: a rough and rather irregular facing, and a finer, more regular facing. Judging by the traces, the former was probably made with a sharp instrument, perhaps similar to a gouge (chisel) or a pointed chisel (Figure 150), while the latter was probably made with a coarse-toothed chisel, which renders the regular hatched pattern (1). For all the four walls of the funerary chamber, the blocks of the first course, c01, have flat surface faces (more or less refined), except for their upper parts, which protrude towards the chamber interior (Figure 100). The protrusion can be recognized even under the plastered surfaces, as the wall surface curves slightly. Each block presents a different length, height and thickness of the protrusion, which tends to have (an initial) rectangular shape. The length of the protrusions can cover almost the entire length of the block (see FC_ S_c01_B3?), except 5 cm - 6 cm of smooth margins, or only smaller parts of it (as if the protrusion were partially taken off). The height of the protrusions is up to 15 cm, while the depth may reach *c.*

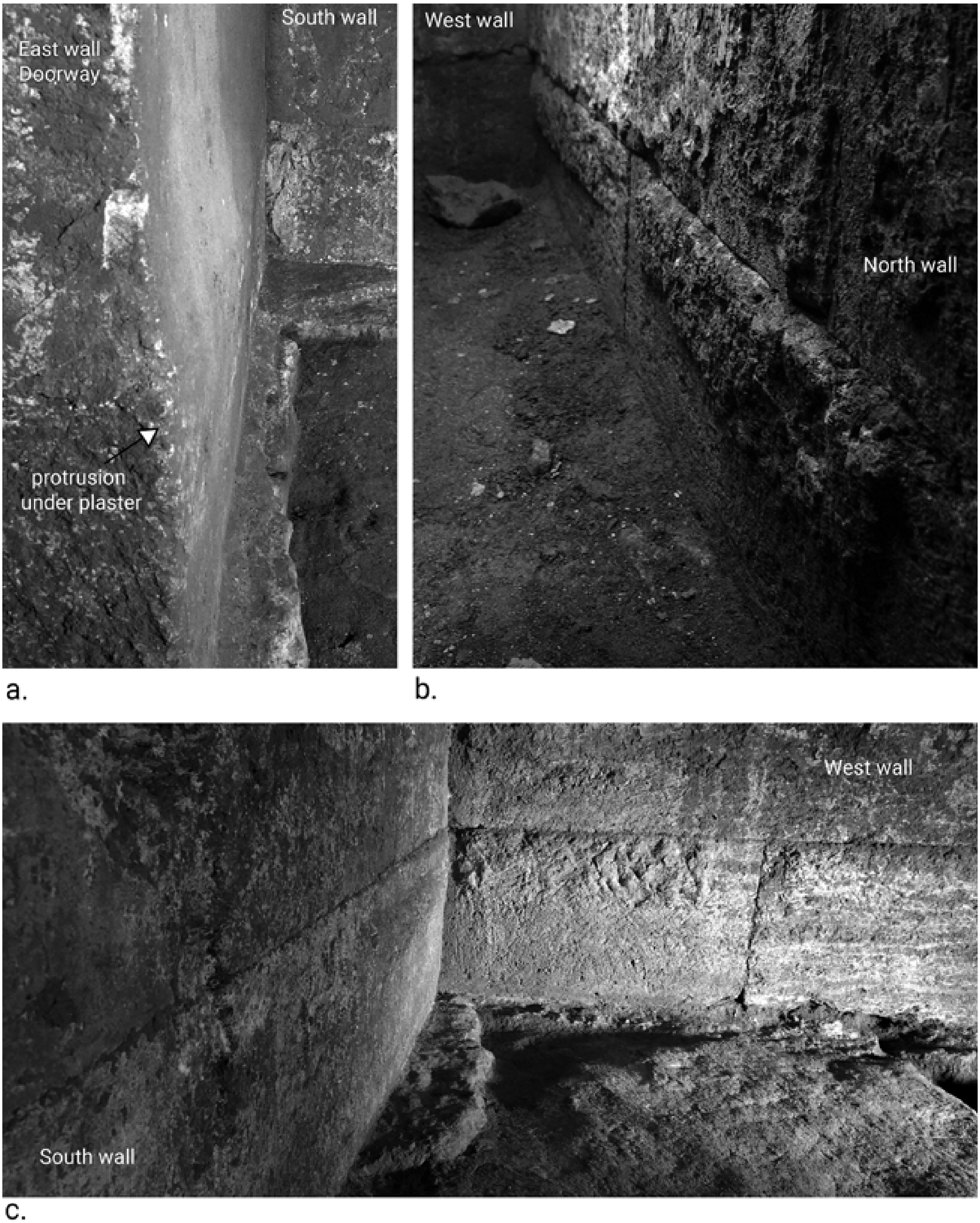

Figure 100. Projecting parts of the blocks in the lower course (funerary chamber).

3 cm. For some blocks it is difficult to determine these parameters, as the protrusion is covered by plaster (FC_N_c01_B3; FC_S_c01_B1-B2; and all the blocks on the eastern wall, FC_E_c01). The protrusions seem to have been partially removed only for those areas of the blocks subsequently covered by the lateral side walls of the *kline*-sarcophagi. The fixation orifices carved in the chamber walls, for the lateral sides of the sarcophagi, were also found above the same blocks of the lower courses on which the embossing was partially removed.

This particularity[11] of the dressing of the building blocks raises the following questions: why do the protrusions occur only on the blocks in the first course, and what was the purpose of these embossed parts?

In ancient buildings, small, embossed elements of stone blocks were frequently used to facilitate their handling and fitting in position,[12] or to protect them during handling;[13] but those are punctual elements, while in Documaci they are linear elements. The punctual projecting elements were apparently designed for shorter blocks, while here we have more elongated blocks, for which manipulation was probably more difficult, thus these linear protruding elements may have been the practical answer. These handling elements were to be removed after the blocks were in position. For some obscure reason, they were removed on all courses (assuming that the same method was also used to handle the blocks in the upper courses) except the first, where they were only removed partially. Was it because the first course was the last to be finished and there was not much time left? Or was it that the constructors considered this finishing unnecessary as it was less visible?

The vault of the funerary chamber

The main sources used for the following presentation of the vault covering the funerary chamber are the photographs made in the 1990s (Anișoara Sion, Alix Barbet and Teodor Bănică, generically named 'archival photographs'), the survey of Anișoara Sion made in the 1990s, the orthophotographs made in 2018 by Călin Șuteu and some pin-pointed *in situ* observations made in 2019, the last two sources documenting only the intrados of the vault.

The relation between the walls and the vault

The vault which covers the funerary chamber is of the round barrel type, implementing the use of true arches, two of the emblematic architectural innovations of the Early Hellenistic period connected with the Macedonian military milieu (Boyd 1978). It springs on the northern and southern chamber walls (FC_N and FC_S), resting its lateral margins on the western and eastern chamber walls, as can be observed at both intersections. From a spatial point of view, the vault continues the northern and southern vertical walls by connecting them with its curved surface, while also completely covering the structure of the funerary chamber.

The structure and elements of the vault

The vault was built from 17 courses, perfectly describing a semi-circle rising for about 1.8 m (on the interior) over the supporting walls (Figure 125), thus having an interior span of a maximum 3.57 m on the eastern side (close to the values of the room's western and eastern walls), and 3.49 m on the opposite side.

A wooden frame was probably used for its construction and removed after it was closed.[14] According to the photographs made when the structure was almost entirely uncovered (Figures 101-102), and to the observations made by Anișoara Sion, at least some of the voussoirs[15] were connected by lead clamps.[16] Some of the cavities used for these connections are visible in the archival photographs (all of the exterior of the vault), while a few others can be currently observed inside, where the dislocations of the voussoirs are broader (Figure 103/b).

[11] Editors' note: A similar situation can be observed in the first course of the Caryatides tomb at Sveshtari, Sboryanovo, too, a funerary construction of similar chronology to Documaci, perhaps a little younger: several of the blocks on the left side of the entrance presented linear embosses on their exterior faces. The other blocks of the elevations had no bosses even if they were never meant be seen either. They were generally worked to have drafted margins and central parts left just hammered, projecting (Stoyanov, Stoyanova 2012).

[12] Ginouvès, Martin 1985: pl. 33, figs. 1, 6 and p. 121-3, *sv* 'tenon (de bardage)', en. *handling boss*, *lifting boss*. The example of the *stylobate* at Segesta, where the blocks still preserve the handling bosses, is dated *c.* 420 BCE, according to https://www.livius.org/pictures/italy/segesta/segesta-temple-stylobate/ (accessed 8 Nov. 2019).

[13] Editors' note: from the Archaic period onwards, individual blocks arrived from the quarry at a slightly larger scale than the intended final dimensions, having protective mantles (*apergon*), along with projections or tenons (Martin 1965: 99). These were sometimes clearly meant for help in lifting. But in some cases, such as Segesta, these projections were probably meant to give blocks further protection during the repeated manipulations of the construction process (Mertens 1984). On some temples, even those that appear to have been completed, the protective mantles were retained, especially at the level of the platform, perhaps for decorative effect (Kalpaxis 1986).

[14] Editors' note: To build a wedge-stone vault above the chambers, a so-called 'lost scaffolding' is usually required. The supports were mostly made of wood, meant to support the *intrados*; they were anchored in the chamber walls (some tombs still preserve the beam holes in the masonry, i.e. the tomb near Pecineaga, see T4, Chapter 3.4), or probably placed on the chamber floor. Occasionally, an earth backfill of a chamber was also used as a scaffold lost through suction. The scaffolds were removed from the chambers after the last keystone had been placed from above. The keystone row was thus never clamped. For this, the vault had to rise simultaneously on both flanks (Mangoldt 2012: 35; Boyd 1978: 98).

[15] A *voussoir* is a specially carved block, trapezoidal in section, with two arched surfaces (one larger, the other smaller) and four straight ones used in dry joints. They are used in symmetrical arrangements in relation to the centre of a curvature, thus in various variants of arches.

[16] Editors's note: known as 'clamps and dowels', in general the arches of trapezoidal blocks did not need additional fasteners; they were supported by geometry tightness/inherent structural stability (Boyd 1978: 97). Boyd recalls a few cases of such vaults that used additional fasteners (although he admits that some may just not have been visible for various reasons): the covered access passage to the Olympia Stadium, the underground tunnel of Ptolemaion of Samothrace (for which he notes the inconsistency of their application – in the sense that they seem randomly distributed). For Macedonian tombs with leaded clamps at Pella I, see Papakonstantinou-Diamantourou 1971: 170; for Stavroupouli, see Mangoldt 2012: 244-246; for Sboryanovo, northern Thrace, see Chichikova *et al.* 2012. Staples are never on the extrados.

Figure 101. Funerary chamber vault *extrados* (details from photos by V. Georgescu, 1993-1995).

Number and arrangement of voussoirs

Inside the funerary chamber (Figure 103/a), the majority of the voussoirs can be distinguished on almost all courses, as the plaster was predominantly lost along the joints. This is the case especially for the upper courses, where water could penetrate the structure more easily. For the courses near the springs of the vault the coating is better preserved, and thus the information about the voussoirs behind it can only be assumed, based on the general pattern of the vault's stereotomy and perhaps on the nuanced colour alteration of the plaster (perhaps suggesting a joint behind). The survey by Anișoara Sion also contains a plan of the covering elements of the tomb, but unfortunately the representation lacks the lower courses (since in this projection they are hidden by the upper courses). However, this plan is especially useful for several other elements, which will be presented when necessary. If for the walls one could allow, based on the available data, that there might have been an intentional pattern in their stereotomy, this is less obvious for the vault. Except for the first two courses on the southern part of the vault, where there is no reliable hint regarding the number of voussoirs, and another three courses which have five voussoirs each (*c06*, *c07*, and *c10*, underlined below) all the rest of the courses have four pieces each. As can be observed, relative to the spring and the crown courses (*c01*, *c17* and *c09*, in bold below) there is no rule in the alternation of four and five voussoirs per course: 4 – 4 – 4 – 4 – 4 – 5 – 5 – 4 – 4 – 5 – 4 – 4 – 4 – 4 – 4 - ? – ?

Dimensions

The dimensions of the voussoirs are only partially available. No direct measurements were possible in our on-site investigation campaigns, mainly because of the inaccessible height but also due to other limitations. Only a limited set of points was acquired with a total station, especially for the dislocated blocks. The dimensions presented below are predominantly based on the orthophoto,[17] while others are according to the drawings of Anișoara Sion.

One has to note that the voussoirs are not parallelepipedal volumes (like the blocks used in the construction of the walls), but wedge-shaped, so that they can fully describe the extrados and the intrados of the vault, without using binders. Their sections can be reduced to a trapeze, even if the lower (smaller) side was slightly curved. The lower side, which corresponds to the intrados, is smaller than the upper side, which corresponds to the extrados. Normally, this means that the width and length of the intrados of the voussoirs are smaller than the corresponding sides of their extrados.

The orthophoto is useful for assessing the interior lengths of all the visible voussoirs and for the interior width of the crown course (*c09*), and presumably with insignificant errors for the neighbouring ones (*c08* and *c10*).[18] Notably, for the extreme voussoirs of each course, the width was approximated with an extra *c.* 60 cm, which corresponds to the estimated thickness of the wall upon which they rest. Based on these measurements, the lengths of the voussoirs vary between *c.* 60 cm (*V_c07_B1*)[19] and *c.* 140 cm (*V_c08_B4*)

[17] The *intrados* image was referenced to the measurements made with the total station, so that errors would be minimal.
[18] For the rest of the courses geometrical calculations can be made to obtain their real width (besides direct measurements), but errors will increase towards the springs of the vault.
[19] This voussoir is not visible from the interior. It was identified based on the archival photographs with the extrados of the vault and confirmed by the drawing of Anișoara Sion (where it has a length of 50 cm on the extrados).

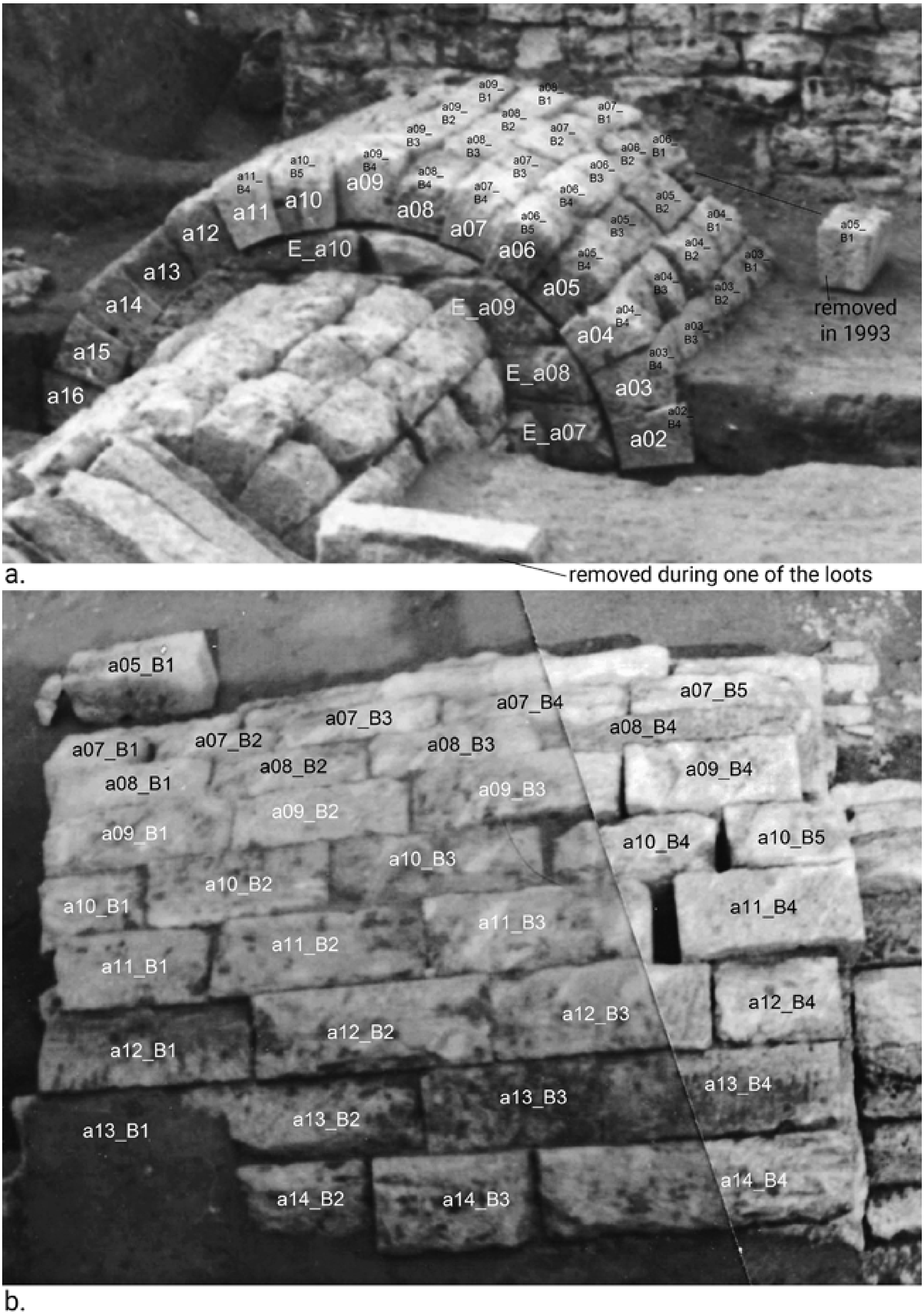

Figure 102. Funerary chamber vault *extrados*: labelling on photos by T. Bănică from 1993.

Figure 103. Funerary chamber vault *intrados*: a) moved voussoirs above the entrance; b) detail with the orifice of a clamp and *anathyrosis*; c) fine carving of the *intrados* blocks.

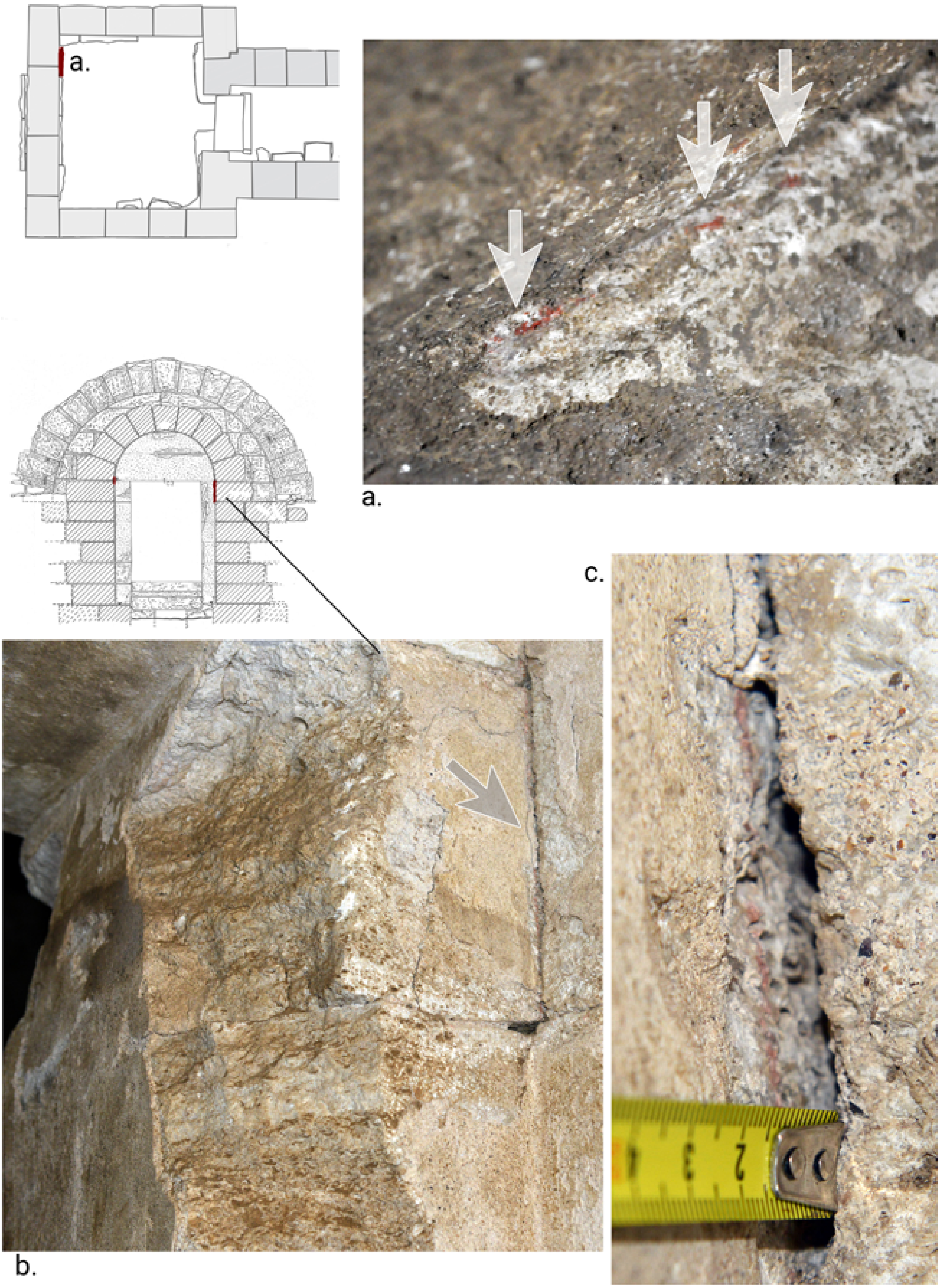

Figure 104. The markings of the ancient architect, with ochre pigment: a) for setting the back wall of the chamber on the plinths; b-c) for arranging the vault of *dromos* I on the eastern wall of the chamber based on observations made by Al. Teodor.

Figure 105. Overlap between the drawing (Barbet *et al.* 1994: Figure 41) made by A. Barbet's team in 1994 (black lines with labels and dimensions) on the orthophotograph of the north chamber wall recorded in 2018 by C. Șuteu. Since creation, *c.* 34% of the coloured plaster on this wall has been lost. Some loses happened also between 1994 and 2018. The French team labelled the blue-black as noir (N) data analysis by Al. Teodor.

for the extreme positions within the courses, and between 67 cm (*V_c04_B3*) and 127 cm (*V_c13_B2*) for the interior positions within the courses (note that there are no significant differences). The average length is *c.* 100 cm per *voussoir* on a total length of about 420 cm per course (thus, largely four blocks per course), although the values may be oversized.[20] The estimated number of blocks used for the vault is 71.[21] The intrados width of

[20] An average of 54 blocks out of a presumed 71 (see next note), for which the intrados length is known.
[21] Considering four blocks for the courses with unknown number.

the blocks in the central courses varies between 33 and 35 cm, with the maximum in the crown course.

The extrados plan from the documentation of Anișoara Sion is useful for the outer lengths of the visible blocks in the orthogonal top projection, and, similar to the interior elevations, for the widths of the blocks in the central courses. The *extrados* lengths of the voussoirs range between 50 cm (*V_c10_B1*) and 132 cm (*V_c14_B4*) for the extreme blocks of the courses, and between 59 cm (*V_c06_B3*) and 125 cm for the interior blocks of the courses (note that there are no significant differences). The average length is 93.5 cm per voussoir on a total length of about 397 cm per course. The width of the central courses varies *c.* 40 cm - 42 cm for the crown course and 36 cm - 38 cm for the neighbouring courses (north and south).[22]

Dressing

The voussoirs have differentiated types of stonework for their sides, depending on the positions of the sides within the vault (Figure 103): the top of the voussoirs, corresponding to the extrados, was rough (more or less as it came out of the stone quarry); the sides corresponding to the neighbouring voussoirs to which they were connected, were dressed with *anathyrosis*,[23] and the bottom, corresponding to the intrados of the vault, was uniformly dressed with the same regularly hatched pattern used for the blocks of the walls. The latter were not intended to be visible, as they were, ultimately, plastered.

Conservation state

Three voussoirs (a10_B5, a10_B4 and a11_B4) above the entrance were found dislocated from their joints (Figure 103). The cause is unclear – either recent occurrences, due to the mechanical excavator standing directly above the chamber during the illegal activities of 1993, or to the complete removal of the soil covering of the vault and thus loosening the binding forces keeping the vaults together, or more ancient activity, caused by the general movements of the blocks, affecting also the eastern wall (drifting towards the south by *c.* 2 cm) – under the pressure of the vault discharge under the lintel ends. The voussoir a05_B1 was removed intentionally during the 1993 excavations to allow the archaeologists to enter the tomb. It was replaced in the structure afterwards.

[22] The dimensions of the voussoirs in the transversal sections do not correspond to those on the *extrados* plan. Ex. *extrados* of the vault and confirmed by the drawing of Anișoara Sion (where it has a length of 50 cm on the *extrados*).
The average of 54 blocks of a presumed 71 (see next note), for which the intrados length is known.
Considering four blocks for the courses of unknown number.
The dimensions of the voussoirs in the transversal.

[23] Ginouvès, Martin 1985: 105, '*anathyrose*' and pl. 4.3, h.

Wall plinths, floor elements and looting pits

Maria-Magdalena Ștefan, Dan Ștefan, Tomasz Bochnak

Important data about the floor and wall plinths in the funerary chamber were obtained in trench S9 – the single excavation we made in the funerary chamber. It was opened in the autumn campaign of 2018, in the chamber's north-east corner (Figures 59; 107-109). Measuring 1 m (EW) x 1.5 m (NS), this trench cut half of the entrance area, initially covered by the threshold block, now slanting towards the *dromos* in a secondary position. Other details regarding the depth of wall foundations were obtained in a very small excavation (30 cm x 30 cm) made at the base of the western wall, as well as from the older documentation compiled by A. Sion for SV/1994 – opened on the exterior of the western wall (Figure 80/a).

Based on these sources, we noticed that the tomb had been built with its walls resting on massive limestone plinths fixed along their thickness in a black clay layer. This construction layer, well compacted, was added before anything else under the entire future area to be covered by the mound – the zero construction level/ initial levelling. It was visible in the space between the plinths, descending for *c.* 10 cm under them (Figure 109/a-b). The foundation blocks (plinths) were dressed only on their upper sides and, probably, just to half the heights of their lateral sides – those facing the interior of the chamber. We interpret this reduced lateral dressing as an indication for the thickness of the floor slabs fitted in continuation of the plinths. The plinths measured *c.* 31 cm - 32 cm in height (at least where checked – the northern and western walls), as much as a regular row of ashlars. Their widths had to be larger than those of the walls, *c.* 70 cm to 90 cm, as they were found to extend towards the interior and exterior of the tomb (in trench SV/1994). In the chamber, plinths can be seen under all the walls (Figure 106), even if at this moment, from minimal excavations, only in their superior levels. A plinth on the southern wall, corresponding to the corner of Bed 1 (see next section) was carved at a right angle. This might suggest that the *kline*-beds were fitted directly on the levelling and not on a stone floor.

The absolute elevations for the plinth upper parts (Table 9) shows uniformity, even if they were not dressed necessarily that finely. The largest difference appears along the northern wall, between the higher north-east corner and the lower north-western one (2 cm). We also noticed a difference in the upper levels of the two large plinths supporting the entrance – which recorded the highest values. The reason for this difference may be either connected with the lifting of the unloaded plinth ends during the heavy pressing

Table 9 Absolute elevation values for floor elements in the funerary chamber

FC_wall	Plinth superior side	Plastered floor
North	43.432/43.429 m (E) - 43.45/43.44 m (W)	
South	43.44 m	43.513 m (43.53 m SE corner)
West	43.44 (E) - 43.43 m (W)	
East	43.45 m - 43.44 m (towards the corners) 43.48 m - 43.49 m (under the threshold)	43.50 m

of the lintel sides, or to the differentiate carving style applied to the top surface, in preparation for receiving the threshold block.

Their lengths varied irregularly: 50 cm, 70 cm on the southern wall, 1.30 m, 1.20 m for the eastern wall, 1.20 on the northern wall, 1.38 m, 0.70 m, 1 m for the western wall. The longer plinths each accommodated two ashlars of the first construction row, the joint of which fitted with the plinth's centre.

Judging by the plinth heights and irregular bottoms, they must had been inserted in the black soil levelling, but because the chamber has been excavated inside since antiquity, the surviving stratigraphic sequence identified to date does not allow the formulation of any hypothesis regarding foundation ditches for the walls, as in the case of the *dromos* II sector. The eastern wall of the chamber, the one connected with the *dromos*, seemed to have rested on shorter plinths (20 cm). The plinth's upper level continued towards the chamber's interior with stone slabs, now completely missing. The shape of the plinths observed in S9, under the north-eastern area of the room, suggest that half of their terminal side heights were probably dressed to fit the floor slabs, which might have thus measured a maximum height of 15 cm.

Both the plinths and floor slabs were covered with a thick (5 cm) layer of mortar finished with white plaster, continuing downwards the plastered surface of the walls. Some few remains of the plastered floor only survive along the walls not covered by the sarcophagi, especially in the south-eastern corner of the chamber (Figure 106). The fingerprint of the missing plastered floor can be observed at the base of the northern wall, where a gap remains between the plastered wall and the plinth.

The mortar used in the composition of this plaster was courser, but nevertheless very solid. In S9 we found scattered numerous fragments of this plastered surface of the floor, of the broken stone slabs, and parts of the dressed quadrae originating from the broken northern wall (Figure 107/a), all mixed inside a 50-cm thick deposit (calculated from the upper level of the plinths down), together with Late Roman pottery fragments (cups with stripes, amphorae), chips of burnt marble, and several charcoals.

Therefore this deposit (*Feature 3*), a light-brown loess with uniform colour and sandy texture, filled with fragments of stone, represents the result of the violent and systematic dismantling and looting of the chamber interior, followed, most probably, by a subsequent secondary reoccupation of the space, perhaps a temporary habitation of the 5th-6th c. AD (Figure 107). Areas of blackened quadrae (from smoke) in the northern *dromos* I wall and in the northern chamber wall, where the ashlars had been broken, attest the prolonged use of rushlights fitted in artificial niches. Amongst the pottery fragments found here, two very small pieces were Hellenistic, glazed, one decorated with rouletting, coming from quality vessels which might have belonged to the initial inventory. Under this deposit, a light-brown sandy loess, was found without materials. Our excavation, for now, did not go down further, for fear of affecting the tomb's integrity.

The ancient looters apparently completely excavated the chamber interior, until they reached the walls, removing the initial construction layer completely. Several fragments of this black clay layer were found precisely in those areas underneath and between the wall plinths. Under the corner plinth of the northern half of the entrance, the black layer measured 17 cm in thickness (Figure 109/a-b). Under the northern wall it measured in total *c.* 30 cm in thickness, being observable 10 cm under the plinths and up to below the plastered floor in the corner, between the plinths. The absolute elevation values for this initial levelling are: 43.16 m bottom, 43.51 m up, for under the northern wall, and 43.25 m bottom, 43.42 m up for under the threshold.

A second, later intervention pit (*Feature 4*), with oblique walls, deeper and darker in the colour of its filling, was identified in the area of the threshold (Figures 108; 124). During its initial excavation, from the actual walking level after the floor had been removed, the threshold was moved from its original place. This pit, if oval in its upper part, seems to have the largest diameter of at least 1 m, narrowing towards its bottom to less than 50 cm, and a depth of 1.7 m from the upper level of the

Figure 106. Wall plinths covered with plastered: a) south-eastern corner; b-d) southern wall.

Figure 107. Excavations in the funerary chamber. Trench S9/2018: a-b) dismantling debris; c-d) looting pits.

Figure 108. Excavations in the funerary chamber. Trench S9/2018.

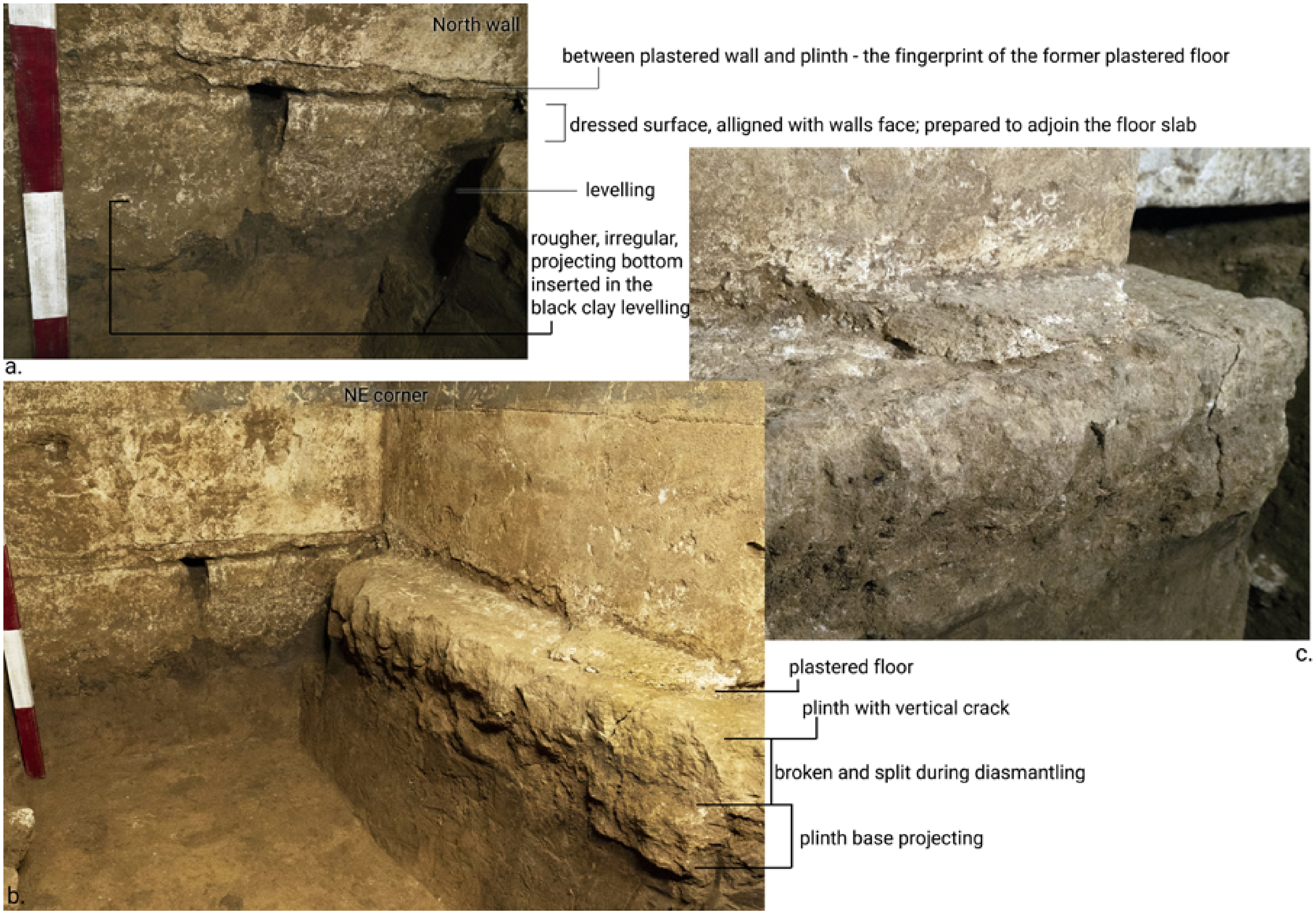

Figure 109. Trench S9/2018: a-b) plinths for the northern chamber wall fixed in the zero-level; c) detail of the plastered plinth of the eastern wall.

eastern wall plinth. Only its northern quarter has been investigated.

Funerary furniture

Alexandra Teodor

The story told by the funerary chamber walls

In a room finished with painted plaster on the walls and floor, an explanation one would think for the surfaces of the walls, roughly dressed and apparently never covered with plaster, is that they were probably covered by something else, as it is likely that they were not intended to be visible. Although there is no absolute certainty (in terms of straightforward material proof) that this room had furniture, the general analogies for similar graves support this interpretation. Therefore, taking a look at the elevations of the walls, particularly at the plastered/unplastered (rough parament) distribution, one can get an idea about the position and the general configuration of the presumed furniture in the funerary chamber.

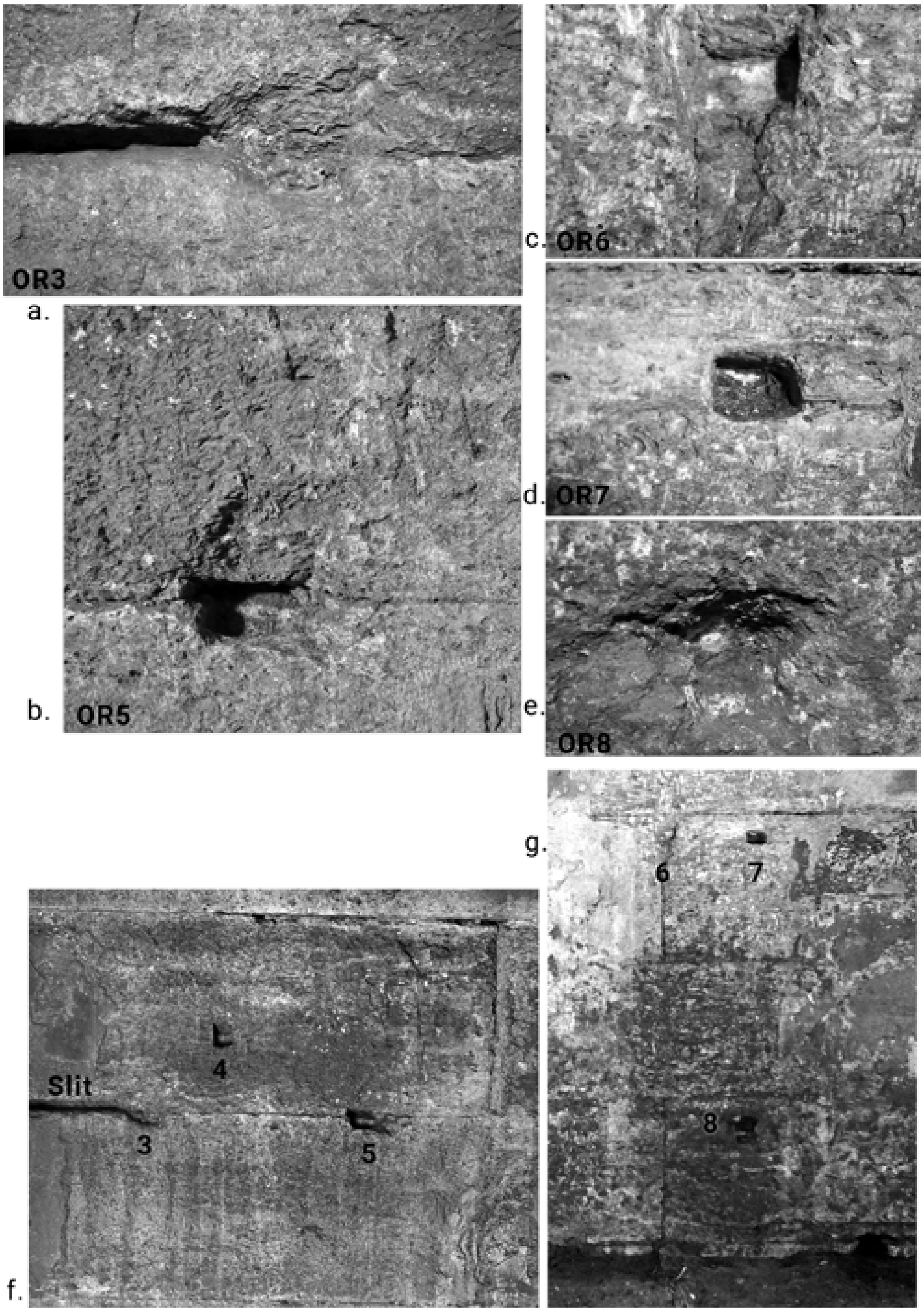

Figure 110. Funerary chamber: a, f) orifices for Bed 1 on the western wall; c, d, e, g) orifices for Bed 2 on the northern wall and (b) on the western wall.

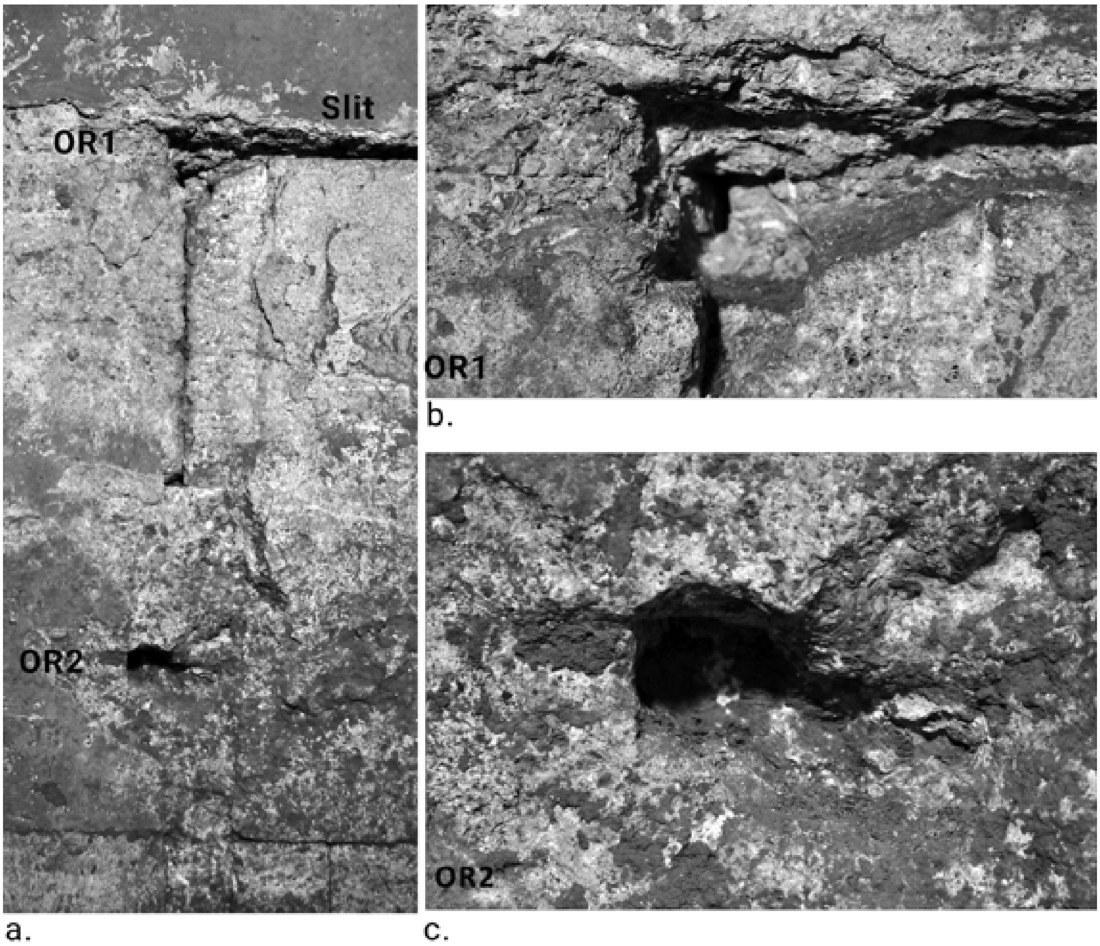

Figure 111. Orifices and slit carved for Bed 1 on the southern wall.

Table 10 Orifices for fixing the sarcophagi on the funerary chamber's walls – metric data.

Orifice name	Wall	Width (cm)	Height (cm)	Depth (cm)	Obs.
OR1	S	4	6	6	continued with the slit on the right; relatively well preserved; enforcement signs on the left, possibly also above-right;
OR2	S	ca. 4 *	ca. 4 *	---	deformed, two sides preserved, the other two only partial; enforcement signs on the left; enlargement on the bottom right (?); dirt/earth
OR3	W	4	3	2	possibly regular shaped inscribed approximated; continued with the slit on the left; consistently enlarged above and on the sides, less on the bottom; enforcement signs on the top-right corner;
OR4	W	ca. 4 *	ca. 4 *	---	best preserved, no enforcement signs
OR5	W	ca. 6 *	ca. 3 *	---	deformed especially on the right and bottom; enforcement from the right (top and bottom)
OR6	N	3.5	2.5	4	deformed on the left and bottom sides; enforcement on the left-top
OR7	N	4.5	3	4	relatively well preserved; enforcement on the right; rust fragments inside
OR8	N	5	6	4.5	deformed on all sides; possible enforcement from the right-bottom
Slit	S+W	103.7 (Sb), 213 (Wt)**	2.5 (S)	3.5	well preserved; deformed end on the W wall; possible enforcement on the top margins

The 'fingerprints' of the furniture are visible on three adjacent walls – southern, western, and northern – i.e. on all except the entrance wall (anyone entering could see these pieces in one glance).

On the southern wall (FC_SW) there was a rectangular piece around 110 cm wide, adjacent with its longer side, measuring over 2 m, to the western wall. The dimensions suggest, with a high probability, a bed occupying the corner, with a base measuring *c.* 50 cm in height (where the white plaster panels begin on the two adjacent walls). We will conventionally name this piece *Bed 1*. The vertical stripes on the walls, on both ends of the presumed bed and above the sitting level, which reach up to *c.* 100 cm on the southern wall, and up to *c.* 130 cm on the western, suggest some back or side elements of the bed.

A second piece of furniture, slightly smaller, continued *Bed 1* on the western wall and turned onto the northern wall; the two beds were very likely attached to one another, or perhaps separated by a narrow space. This second piece, probably also a sarcophagus bed, by its dimensions, our *Bed 2*, was at least 110 cm wide and *c.* 225 cm long. The level to which the plaster begins in the area of *Bed 2* is at *c.* 38 cm above the wall plinths and *c.* 30 cm above the end level of the floor. The height of the unplastered vertical stripe on the northern wall, where *Bed 2* ends, is a clear indication of a side element for *Bed 2*.

As a partial conclusion, based on the elements observed thus far, the two beds may have had similar dimensions: widths *c.* 110 cm, lengths *c.* 230 cm, and heights *c.* 108 cm above the wall plinths, with *Bed 2* deeper than *Bed 1* and only very slightly smaller. The hypothesis of the two beds, in the same position and largely the same dimensions in plan, was also proposed by Alix Barbet in her unpublished reports on the tomb and the painted plaster.[24]

A number of orifices (eight holes and a slit) were found on the three walls, all of them matching the areas presumably covered by furniture.

The long slit on the southern and western wall is perfectly continuous on the two walls, on about the same level (1.03 m -1.06 m above the level of the plinths), although there is a slight inclination of the slit on the southern wall, descending *c.* 1.07°, from east to west, 1.5 cm. It perfectly corresponds to *Bed 1*, thus suggesting that an important element was fitted inside, most probably the marble plate or plates assembling the lid of *Bed 1*, and thus revealing itself to be a sarcophagus.

Marble plates. Analogies for the kline-sarcophagi

Maria-Magdalena Ștefan

The analysis of the stucco coverage on the chamber walls, carried on *in situ* and presented previously by Al. Teodor, indicates that in the Documaci tomb there were, initially, two *kline*-like funerary structures arranged in a 'Γ' plan along the western and northern walls, similar to numerous cases known in other Macedonian type tombs. This arrangement was the commonest, while fewer tombs had furniture arranged in a 'U' plan (Miller 1993: 14-15; Sismanidis 1997). These layouts ensured that there remained enough space inside the funerary chamber for rituals, or other wooden furniture, revealing also that the tombs functioned as family burial places (Documaci, for example, might had been built for a couple, or two brothers, or a parent and a son/daughter). The two structures at Documaci, sharing similar sizes, had their coverings fixed in two different manners (suggesting that at least one was a *kline*-sarcophagus covered with marble slab(s), engaged in a groove (Figures 111; 116) carved in the chamber walls (*Bed 1*), while their depths were also different. However, despite this morphological variation, the plaster finishing of the walls, which was part of the original architectural design (see further Chapter 9.1), proves that both elements of stone furniture were projected from the start, built after the masonry of the tomb was completed and before the plaster was applied on the walls and floor. The walls of the chamber made two of the sarcophagi long walls, the two short sides being built of stone, and the other two long walls (the visible elements) closed with marble plates.

We interpret the total lack of plaster on the lower courses of the chamber walls as an indication that both beds had a full masonry base, *c.* 48-50 cm high for *Bed 1* and *c.* 38 cm for *Bed 2*. As the stone slabs of the floor were completely removed during the ancient lootings, it is difficult to say if there were any under the sarcophagi, or if they were placed directly on the ground. The wall plinths in the areas of the beds were in cases projecting towards the interior of the chamber; they bore no traces of plaster corresponding to the floor. In one situation, on the southern wall, the plinth corresponding with the southeast corner of *Bed 1* was carved in right angle to fit a specifically cut stone piece – this might be an indirect clue, that the beds rested directly on earth.

The courser white plaster, perhaps lacking the top finer finishing,[25] laid between the full stone base-plinth

[24] It was not formulated in words, nor explained, but illustrated in the sketch of the plan for the tomb. Our interpretation was not influenced by this drawing, since the latter was received by e-mail on January 27th, 2019, while our notes were taken on site in October 2018. The dimensions proposed for the beds (by drawing, scaled) are ca. 110 x 250 cm for *Bed 1* and 110 x 230 cm for *Bed 2*. Barbet *et al.* 1996, fig. 38 (plan).

[25] No analyses of these plastered areas have yet been made.

and the coloured painted wall above the beds, has to correspond with the sarcophagi interiors (Figures 112; 114) as an empty space (*c.* 55 cm deep, 2 m long, 1.03 m wide for *Bed 1* and 68 cm deep, 1.90 m long, 1 m - 1.03 m wide for *Bed 2*). For the bed placed in front of the entrance (*Bed 1*) this is particularly clear, as the plastered area falls under the rectangular slab(s) lid engaged in the horizontal 'Γ' groove, carefully carved on the southern and western walls. The narrowness of the groove (3 cm - 2.5 cm, Figure 116/a-c) suggests that the slab lid, or the slabs, had to be very thin (about 2 cm), thus made of marble. We have to assume also that the remains of the deceased (either inhumed, as was customary in Callatis, or cremated and placed in a casket) were deposited beneath this lid. The length of the sarcophagi interiors could accommodate without height restrictions any inhumation. There is no groove on the northern wall to correspond with *Bed 2*, but the presence of the rougher plaster in the intermediary position between the painting and unplastered courses, suggests that this bed had also an empty space above a full base. Was this sarcophagus ever covered? Perhaps it was just prepared and never got to be actually used.

The lateral and inferior margins of these plastered areas were not neat (Figures 114/a; 115/b), hinting that the plastering was done after the stones for the bed sides were fixed on the chamber walls. The slab lid for *Bed* 1, was laid 2 cm underneath the upper margin of the lowest frieze, on the southern wall, while in case of *Bed* 2, the frieze is with 1 cm beneath the plastered area on the northern wall, corresponding with the interior (no clear upper margin for this bed can be established). In any case, it seems that the position and height of the lower frieze was established in relation to the *kline*-sarcophagi tops (Figure 92). The apparent difference (*c.* 2 cm) between the frieze and lid of *Bed 1* may suggest that the space was completed, in the areas of the feet carved on the lateral marble slabs, with projecting parts. The capitals of the feet fitted perhaps the horizontal register of the lowest frieze.

The two beds had their lateral elements additionally fixed against the walls with iron clamps placed in rectangular holes carved in the chamber ashlars – the two orifices on the southeast corner of *Bed* 1 (bottom and top) were meant for fixing the marble slab, carved in relief with imitations of wooden *kline* feet, which was facing the entrance (Figures 114/a; 115). The upper hole was carved directly under the groove for the lid. The lower orifice corresponds with the upper margin of the full masonry base of the bed (5 cm above the inferior line of the plastered sarcophagus interior), however placed eccentrically – on the exterior of the marble plating of the bed. Three other orifices on the northeast corner of *Bed* 2 (two top and one bottom) fixed the eastern, narrow side of *Bed* 2 against the northern chamber wall (Figures 111; 115). Taking into consideration the distribution of the plastering and these holes, we can deduce that the eastern side of *Bed 2* measured *c.* 33 cm in thickness, being very probably made of ashlars, in which case the length of *Bed 2* was 2.22 m. Given the position of orifice 5, the minimum width was 1.10 m (Figure 110).

The two sets of orifices corresponding to each of the two beds have similar positions in relation to the interior of the sarcophagi, with the upper ones laid at the same absolute level (44.48 m - 49 m for orifices 1, 3, 5, and 44.45 m for orifice 7, suggesting that the beds had very similar heights (*c.* 1.07 m). Only orifice 4, on the western wall, belonging to *Bed 1*, at its northern margin, occupied a position 14 cm higher than the lid. These details reveal that the lateral short side of *Bed* 1 measured *c.* 28-30 cm in thickness, being either higher or surmounted by a crowning stone/marble element, like a stone pillow. If both beds were of the same width, an empty distance of *c.* 20 cm can be assumed between them – this remained unplastered (Figures 112; 114/b).

The lid of *Bed* 1 measured 2.15 m in length (including the segment engaging in the groove). The areas on the chamber walls against which the perpendicular short sides of the beds rested, the northern for *Bed 1* and the eastern for *Bed 2*, were specifically prepared to join smoothly with the adjacent beds by removing the embossing of the lowest ashlar course. The dismantling of the beds was made exactly along the corners fixed with clamps, by use of crowbars, the majority of the orifices, including parts of the groove/slit were secondary, were enlarged or broken.

Regarding the heights of the beds (medium 1.07 m) we notice that the ratio between them and the height of the coloured wall (1.726 m) comes remarkably close to the golden ratio. Of course, we are aware that differences in the interval of 1.5 cm - 2 cm remain possible, as the wall plinths are not entirely horizontal, nor the upper friezes, while the walls themselves seemed to have sunk at different points in time due to tamping, but the fact that the proportions of the chamber, furniture, and painted registers were corelated, and that an overall aesthetic composition was searched for, are certainly valid.

Twelve fragments of carved and painted marble plates, some restorable in larger pieces, were found inside the funerary chamber during the excavations carried on in the 1990s. Because no indications for recent trenches made under the level of the wall plinths were identified, we assume that the marbles must have been recovered from the soil accumulated inside since antiquity – which was removed by Georgescu's team and apparently sieved. Initially, these plates were regarded

Table 11. Dimensions for the *kline*-sarcophagi in Documaci Tomb.

<table>
<tr><td></td><td colspan="6">Exterior dimensions</td></tr>
<tr><td>Kline Sarcophagus</td><td>Total length</td><td>Lid length</td><td>Lid width</td><td>Total width</td><td colspan="2">Height from the plinths</td></tr>
<tr><td>1</td><td>2.30 m</td><td>2.15 m</td><td>1.08 m</td><td>1.11 m</td><td colspan="2">1.06 (SW) / 1.08 m (SE)
High foot on the W wall – 1.22 m</td></tr>
<tr><td>2</td><td>2.22 m</td><td colspan="2">no lid</td><td>1.10 m</td><td colspan="2">1.07 m – plastered wall
0.99 m – highest orifice</td></tr>
<tr><td colspan="7"></td></tr>
<tr><td></td><td colspan="6">Interior dimensions</td></tr>
<tr><td></td><td colspan="2">Plastered area length</td><td colspan="2">Plastered area width</td><td>Depth (plastered area height)</td><td>Full masonry base height</td></tr>
<tr><td>1</td><td colspan="2">2.0 m</td><td colspan="2">1.03 m</td><td>0.55 m</td><td>0.50 m</td></tr>
<tr><td>2</td><td colspan="2">1.90 m</td><td colspan="2">1.03 m</td><td>0.68 m</td><td>0.38 m</td></tr>
<tr><td></td><td colspan="2"></td><td colspan="2"></td><td></td><td></td></tr>
<tr><td></td><td colspan="2">Width of the long bed side rested on the chamber’s wall</td><td colspan="2">Width of the short bed side rested on the chamber’s wall</td><td colspan="2"></td></tr>
<tr><td>1</td><td colspan="2">0.07 m, max. 0.10 m</td><td colspan="2">0.32/0.33 m</td><td></td><td></td></tr>
<tr><td>2</td><td colspan="2">0.10/0.12 m</td><td colspan="2">0.32 m</td><td></td><td></td></tr>
</table>

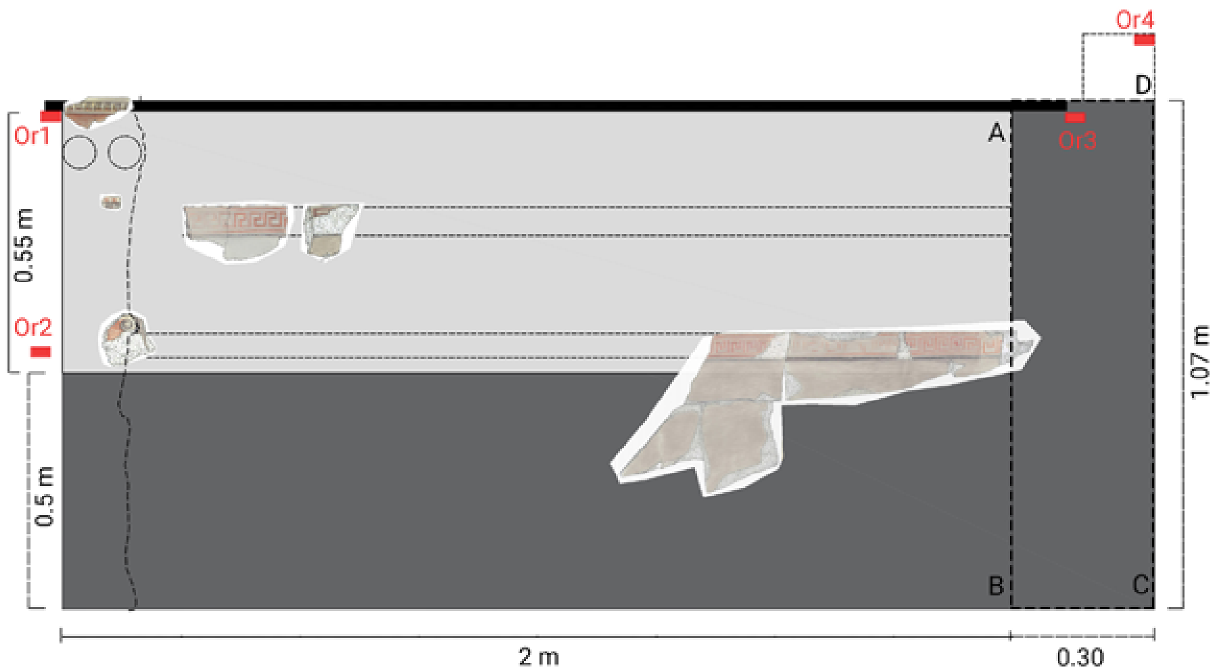

Figure 112. Reconstruction proposal for *kline*-sarcophagus 1 (Bed 1) 1: A) plastered interior; B) stone base; C) stone lateral short side; D) crowning element; red – orifices; solid black – lid.

as fragments of a door *encadrement*, however, a closer analysis shows that there is not enough space in the doorway, nor *dromos*, for them to have been placed on the walls. Not to mention that the walls of the chamber, *dromos* I and entryway were completely plastered and painted, showing no orifices for iron clamps nor other traces to suggest that something else was fixed above the polished plaster.

The only orifices (four of them) are in the doorway frame, but the size of the fragmented plates is already larger than the doorway interior walls. It is more

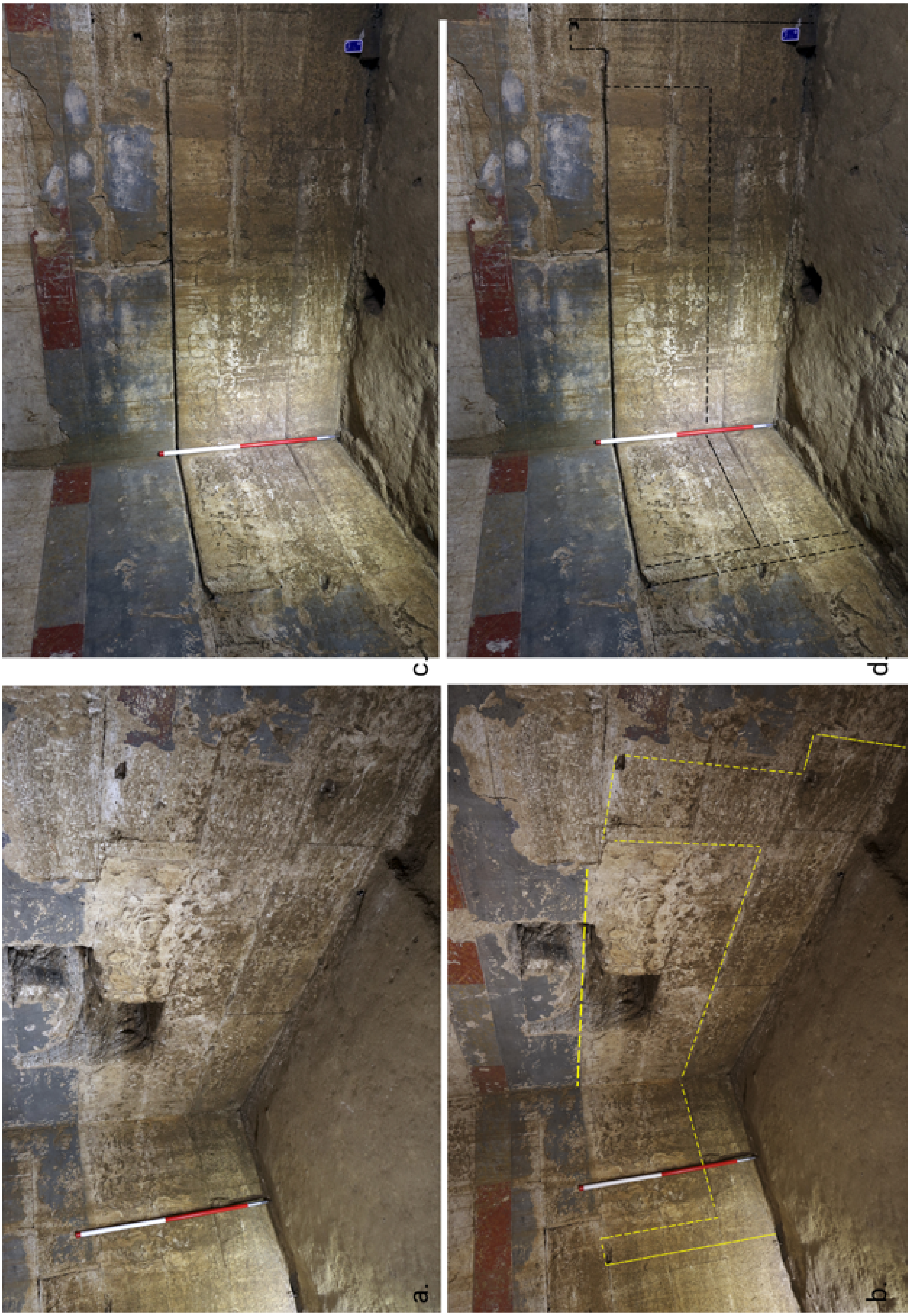

Figure 113. Funerary chamber: a-b) *kline* sarcophagus/Bed 2; c-d) *kline*-sarcophagus/Bed 1.

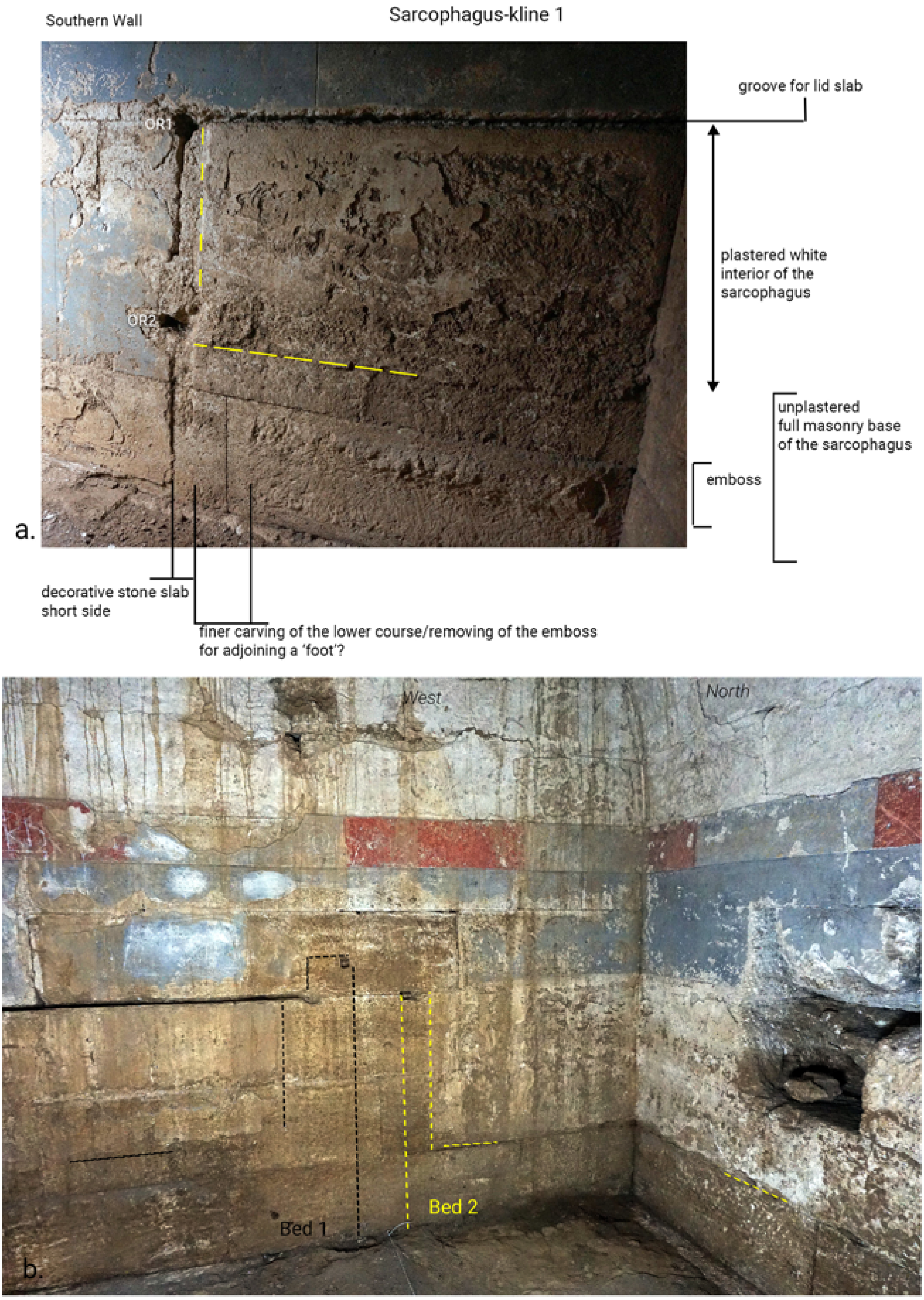

Figure 114. Funerary chamber: a) southern wall, details for *kline*-sarcophagus/Bed 1; b) western wall, reconstruction proposal.

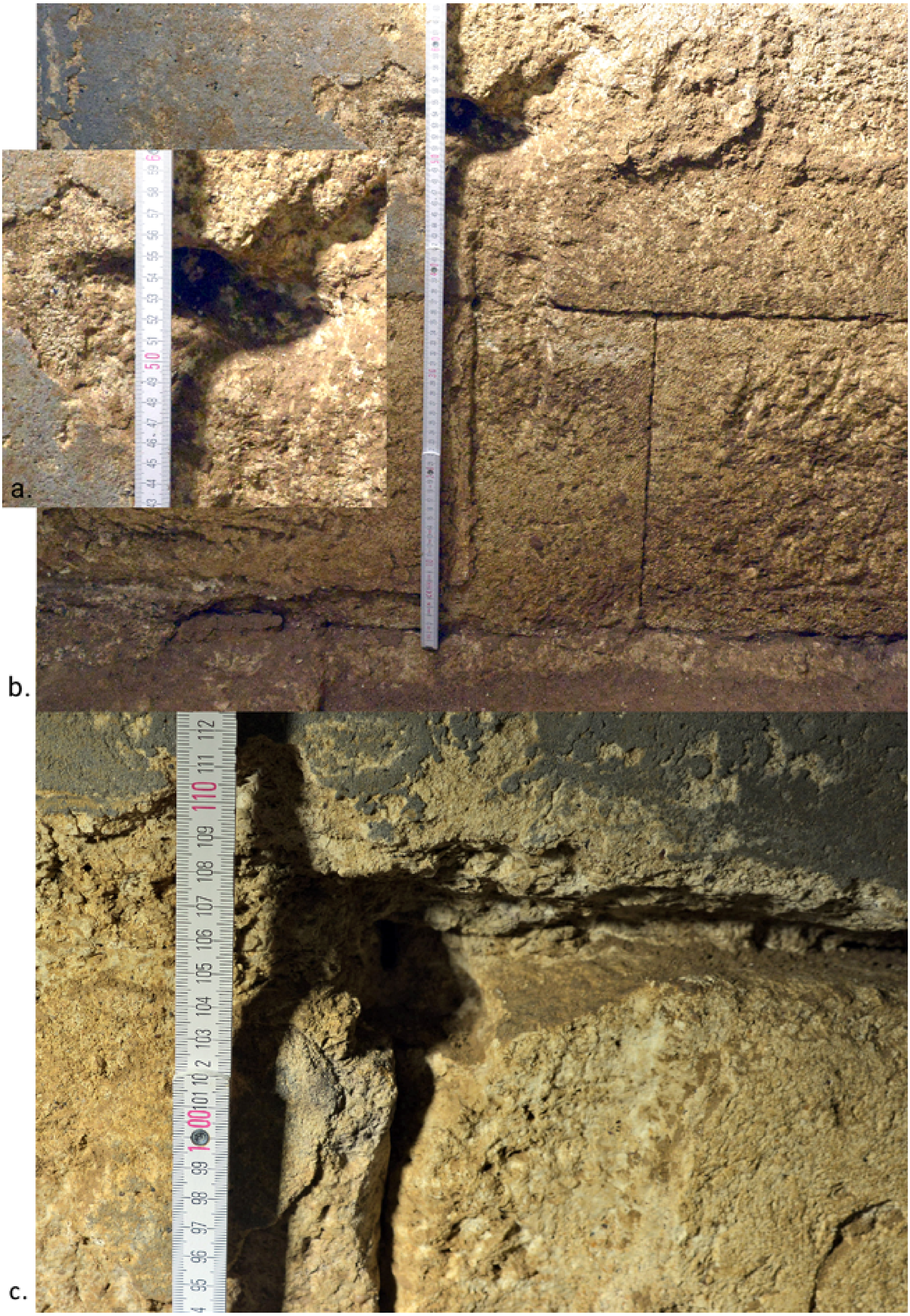

Figure 115. Southern wall, the height of *kline*-sarcophagus 1.

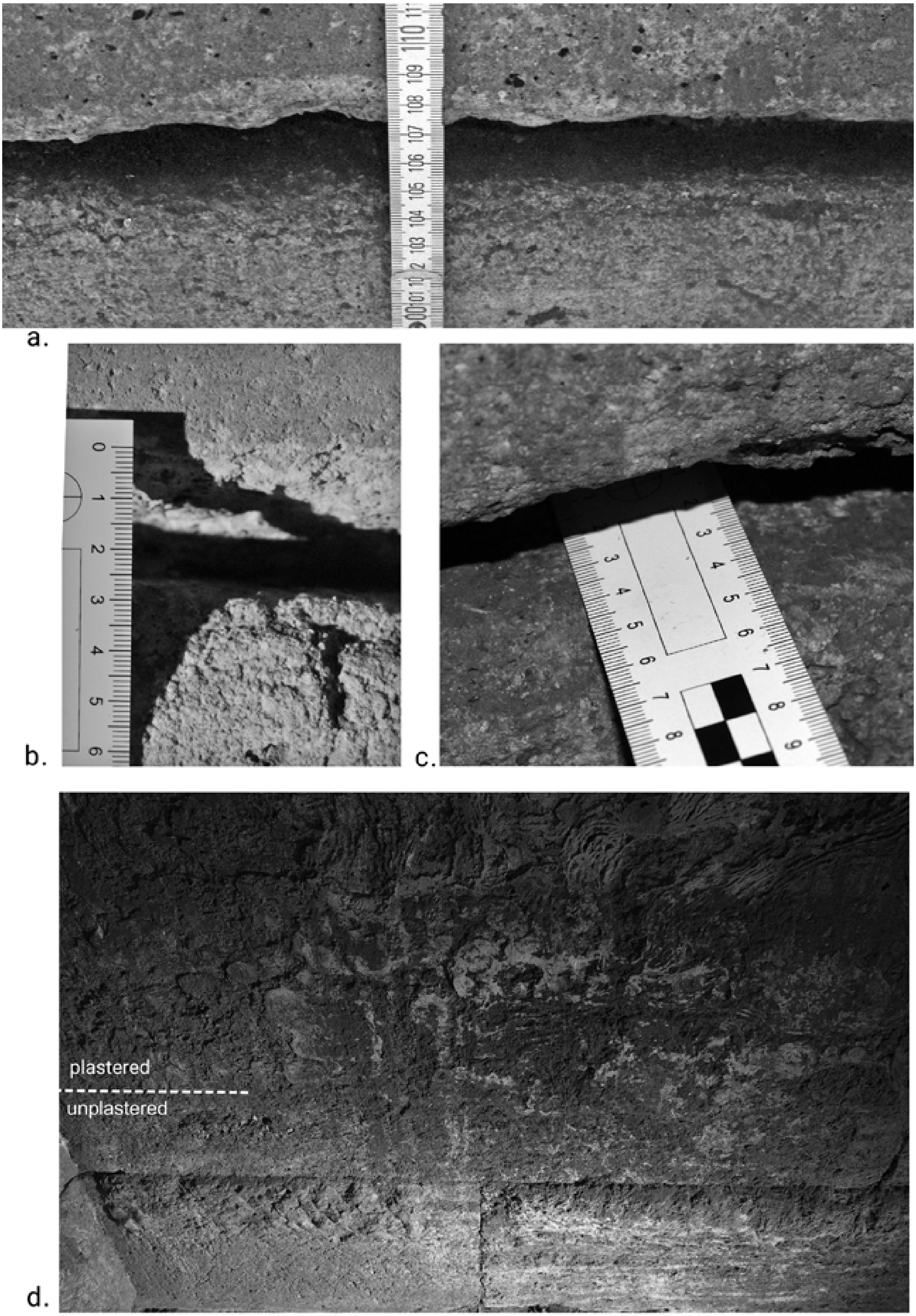

Figure 116 *Kline* sarcophagus 1, details of the lid slit (a-c); d) embossed ashlars, lower western wall, close to the south-west corner.

probable that the marble elements were part of the decorative plating of the two *klinai*, namely of one foot and of the plate between the feet, while the orifices in the doorway were connected with some kind of double-leaf and light-weight door.

The plates represent parts of five different zones, regarding the morphology and decoration of the object(s) to which they belonged: two differently sized Ionic *kyma* (one larger with the adjacent plain plate painted full in red (Figure 117/a1-a2), the other is smaller, with the plate decorated with a chess pattern (Figure 117/c1-c2), a volute fragment also painted in red (Figure 117/d1-d3), and parts of two more massive plates, bordered by a drafted rectangular margin (of two different widths), decorated with meanders painted in red (Figures 118-119). The narrower drafted margin borders the largest and most massive piece of the finds that are assembled now in the local museum (Figure 119). All the marble pieces, despite differences in thickness, have only one face polished and painted, paired with a back one, treated in a rougher manner. The larger and thicker fragments have on this reverse side traces of mortar (Figure 119/g4), and also a single rectangular hole with traces of metallic rust (Figure 119/g5), indicating that they were fixed against a stone structure using clamps, but also mortar as binder.

Traces of a differently coloured ochre-red pigment (Figure 119/g5) were noticed on the back of several marble plates, of the same colour and texture as a few others identified on the walls (Figure 104), which we interpret as markings of the ancient architect.

List of marble Documaci-tomb fragments in the 'Callatis' Museum, Mangalia, found 1993-1994

a. The crowning part of a *kline* leg carved in relief, decorated with Ionic cyma moulding; fragment; 13.7 cm preserved width (incomplete); 6.5 cm preserved height; 3 cm max. thickness; eggs 1.7 cm high; 5 eggs preserved entire and one partially; plate painted in red; the space between eggs painted in red; Inv. 2585 (Figure 117/a1-2).
b. Moulding from Ionic *cyma* (probably from the crowning part of a *kline* leg carved in relief); fragment; preserved height 3.5 cm; preserved width 2.5 cm; egg height 1.7 cm; one egg preserved and part of another; no inventory number (Figure 117/b1).
c. Ionic *cyma*, binding moulding; fragment; 3. 7 cm preserved height; 2.5 cm preserved height; egg height 1.3 cm; the plate decorated with chess pattern painted in red; the space between eggs painted in red; one egg preserved and part of a second; two red 9 mm x 9 mm squares visible; Inv. 2885 (Figure 117/c1-2).
d. Volute; fragment; probably originating from the middle part of the left leg, part of a double pair of volutes; maximum preserved dimensions for the marble piece 11 cm x 11 cm; dimensions for the relief volute 4 cm (wide) x 3. 5 cm (high); on one side the beginning of a squared corner; lateral plate painted in red, volute left unpainted; polished surface; Inv. 2892 (Figure 117/d1-3).
e. Plate with relief margin (the wider, upper linear relief element connecting the two *kline* legs) fragment; preserved height 11 cm; preserved width 10.5 cm; projecting margin height 6 cm; 3.8 cm thick; margin-border decorated frontally with meander painted in red; Inv. 2890 (Figure 118/e1-2).
f. Plate with relief margin (the wider, upper linear relief element connecting the two *kline* legs) fragment; polished surface; preserved height 12 cm; preserved width 22 cm; projecting border height 6 cm; max. thickness 3.8 cm; margin projecting with 2 cm; plate unpainted; margin decorated with meander between two lines painted in red; the upper part of the margin was finished and has traces of paint; a point of deeper red on one of the laterals could be an architect's marking, suggesting also that the larger marble plating of the *kline* was composed of distinct segments. Inv. 2887 (Figure 118/ f1-3).
g. Plate with relief margin (the narrower, lower linear relief element connecting the two *kline* legs) fragmentary, assembled from six different other fragments; polished surface; max. preserved height 33.5 cm; max. preserved length 88 cm; plate thickness 6 cm; relief margin height 5.1 cm; total thickness 8 cm; relief margin decorated with meander between two lines in red paint; traces of red pigment markings on the upper part of the relief margin around the orifice; the back more roughly carved, with traces of mortar; has a rectangular orifice beneath the relief margin, partially preserved (3 cm x 2 cm), enlarged during dismantling; the preservation of a corner descending perpendicularly on the margin suggests that the piece went near the left leg of the *kline*. Inv. 2890-2891 (Figure 119/ g1-5).

The closest analogy for this type of furniture and method of fitting it to the walls comes from Amphipolis IV tomb (Perdrizet 1898: 343), dated at the end of the 4th c. BC. The actual beds were not found here either, just (as at Documaci) fragments of decorated marble plates and a horizontal groove on the wall.[26] The two walls along which the beds ran had, at a height of *c.* 90 cm, a wide slit. Perdrizet described the beds, and we

[26] *'[Une] large rainure horizontale dans laquelle devait s'engager la dalle servant de couche'* (Perdrizet 1898: 343).

think he was mostly right, as empty boxes, parallel to the walls, and closed on the sides facing the entrance by sculpted walls. The slab which functioned as a lid was engaged in the groove carved on the walls. The marble fragments he found belonged to a slender slab painted in red (vermillion, he says) and decorated with a relief shield.

Slits for lids appear associated with two sarcophagi found under the floor of Tomb II at Argilos,[27] also in the area of Amphipolis (Figure 120). A wooden plank floor was presumed here, fixed into grooves. For us, this interpretation seems highly unlikely, if we take into consideration the rest of the building materials employed in the tomb (marble, plaster). The tomb, found looted, was probably used in the first three quarters of the 3rd c. BC, as suggested by the two finds of bronze coins – Cassander and Antigonus Gonatas.

In a Macedonian-type tomb of the first half of the 3rd c. BC in the area of Thessaloniki, at Charialou (Tsimbidou-Avloniti 1986), the stone slabs shaped as pillows and making the upper part of the latest of the three *klinai* sarcophagi (functioning as lids) were also fixed in deep and large grooves carved along the walls (Tsimbidou-Avloniti 1986: 120-126, fig. 2-6). At Documaci, the grooves found on the southern and western wall are nevertheless part of the initial funerary design, not later, being carved with great care and in relation to the plastered surfaces.

The preserved fragments are too few to suggest the shape of the leg. However, the decoration in high relief and paint of the preserved parts of the Documaci *klinai*, the closest analogies (Figure 121) seem to be with the finds of Potidaea (Sismanidis 1997: 23-60), even if here the Ionic cyma was only painted, not carved in relief, the Argilos Tomb 1 (Nea Kerdyllia III) (Mangoldt 2012: 208-209; Sismanidis 1997: 123-126), and Mesolakkia Serres (Asăndoae, Latify 2013; Sismanidis 1997: 81, 112-113), all located in eastern Macedonia and dated around the end of the 4th c. BC. The chess pattern and Ionic cyma on the legs also have analogies in the bed of *Dion I*, dated in the same period. All these beds were assembled from several large marble plates; for the *kline* of Nea Kerdillya, Sismanidis conjectures whether it was an empty bed or a compact structure.

The fragments found so far in the Documaci tomb could all belong to a single bed. Nevertheless, the restricted heights and close values of the two identified relief margins might suggest that they belonged to two different beds, and that the wider ones have not been yet found. The analysis of the plastered areas and positioning of the orifices on the chamber walls reveal as well that both beds had their long sides fixed on the walls in a narrow and unplastered sector, compared to the shorter sides that rested on the adjacent walls, which were thicker. Thus we conclude that both beds were decorated on their long sides with marble plates – thin enough to fit in the available space left on the walls (8 cm -10 cm wide). The fact that marble splinters were recently found in the fill of trench S9, under the floor, is an indication that a future and larger excavation of the chamber could expose more fragments of this type of decoration, scattered in the deposit formed after the ancient looting.

The discussed analogies indicate that the *klinai*-sarcophagi in the Documaci tomb were luxurious items of large dimensions, of possible east-Macedonian origin, with analogies dated around 300 BC and earlier. The large widths do not rule out the interpretation of double burials for each sarcophagus.

Funerary chamber entrance and access corridor

Maria-Magdalena Ștefan

The 2-m high entrance in the funerary chamber has a slightly trapezoidal frame, with walls tapering towards the top (Figures 122; 124; 92/a). The width difference is 7 cm from foundation plinth to the plain, undecorated lintel. The tapering was probably accentuated by the subsequent sinking of the northern part of the doorway towards the south (see further, V. Cetean's Chapter 8.7 for details). The joint lines carved in plaster on the eastern wall of the funerary chamber fall 1.5 cm in less than 1 m, near the northeast corner. The sinking has to be related to the weight pressing upon the lintel, which, being probably too short (despite, being 169 cm long, 44 cm high, and the largest block of the structure), has discharged abruptly towards its ends. A long vertical crack through several rows of ashlars, also causing the falling of plaster along its course, can be traced, starting from the northern end of the lintel reaching the lower frieze (Figure 122/a). Entire pieces of the ashlars near and beneath the lintel had split because of the weight, at both its ends. A vertical crack can be observed also in the eastern wall plinth, directly under the northern margin of the entrance, splitting in two the entire slab. The lintel was connected with the neighbouring ashlars by a small step (southern, low end), while at the northern end a defect or split in the lower margin of the northern end was completed with a different type of rock inserted in the gap, filled afterwards with mortar.

The thickness of the doorway is 58 cm - 59 cm, corresponding to the thickness of the blocks in the eastern chamber wall, with the exception of the first two courses on the northern side, where the width is 60 cm. The interior of the doorway was finished in white plaster in continuation with *dromos* I.

[27] Nea Kerdyllia IV, see Mangoldt 2012: 210-211, with bibliography.

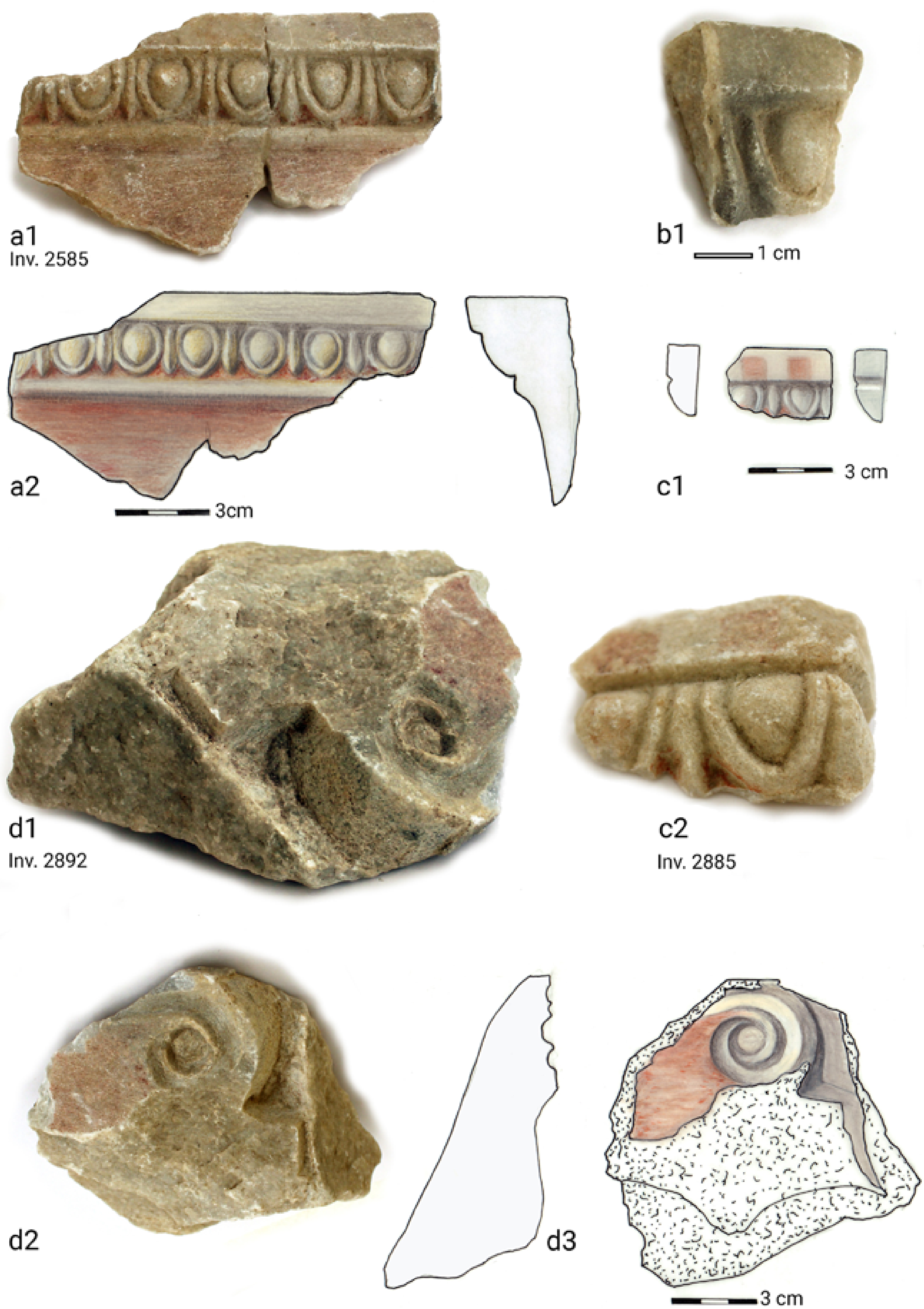

Figure 117. Marble fragments found in 1993-1995 at the Documaci tomb by V. Georgescu, currently in the 'Callatis' Museum of Mangalia (photos by M.M. Ștefan; drawings by Fl. Marțiș).

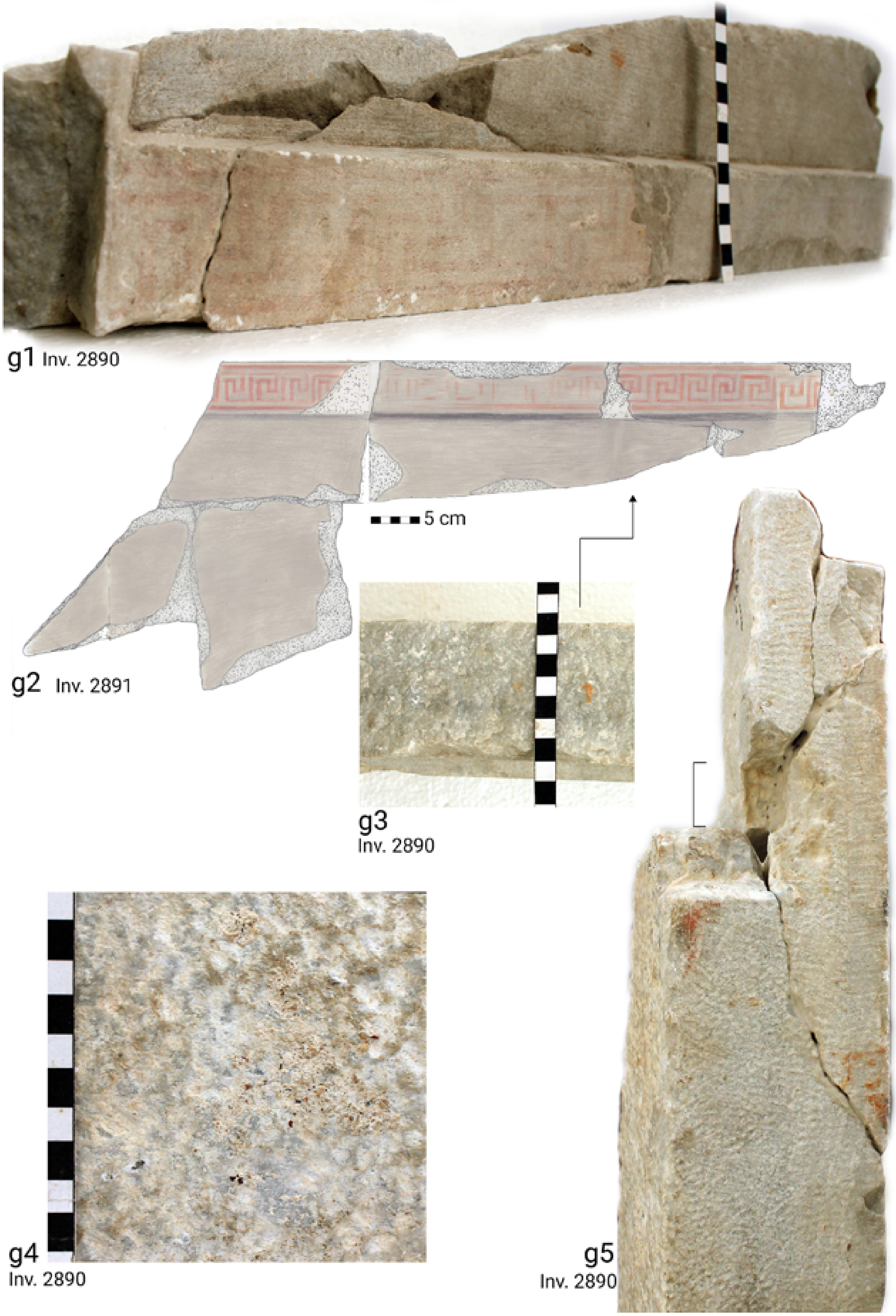

Figure 118. Marble fragments found in 1993-1995 in the Documaci tomb by V. Georgescu, currently in the 'Callatis' Museum of Mangalia (photos by M.M. Ştefan; drawings by Fl. Marțiș).

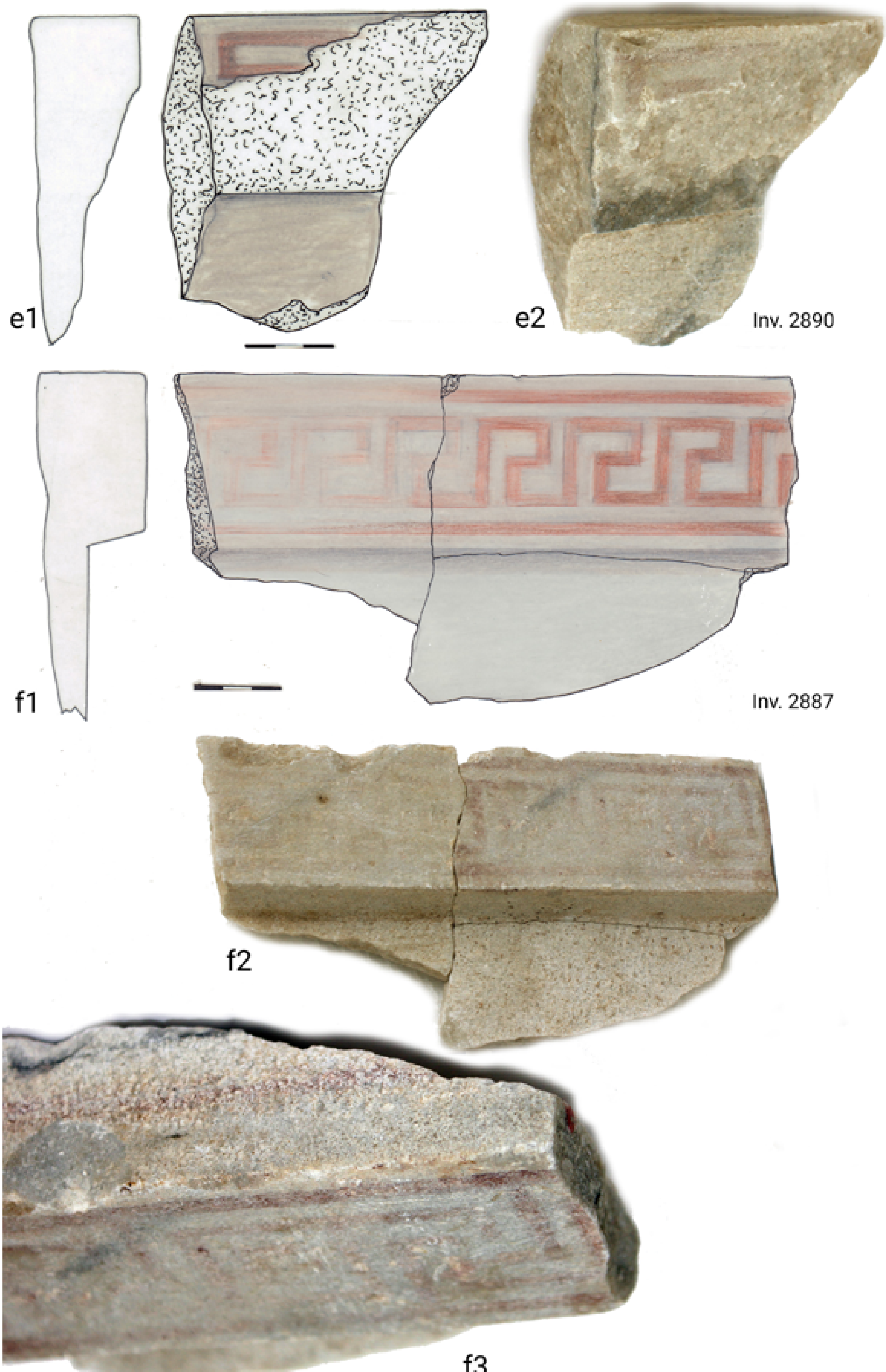

Figure 119. Marble fragments found in 1993-1995 in the Documaci tomb by V. Georgescu, currently in the 'Callatis' Museum of Mangalia; g4) traces of plaster; g) piece with fixation orifice on the back and traces of red ochre pigment (photos by M.M. Ștefan; drawings by Fl. Marțiș).

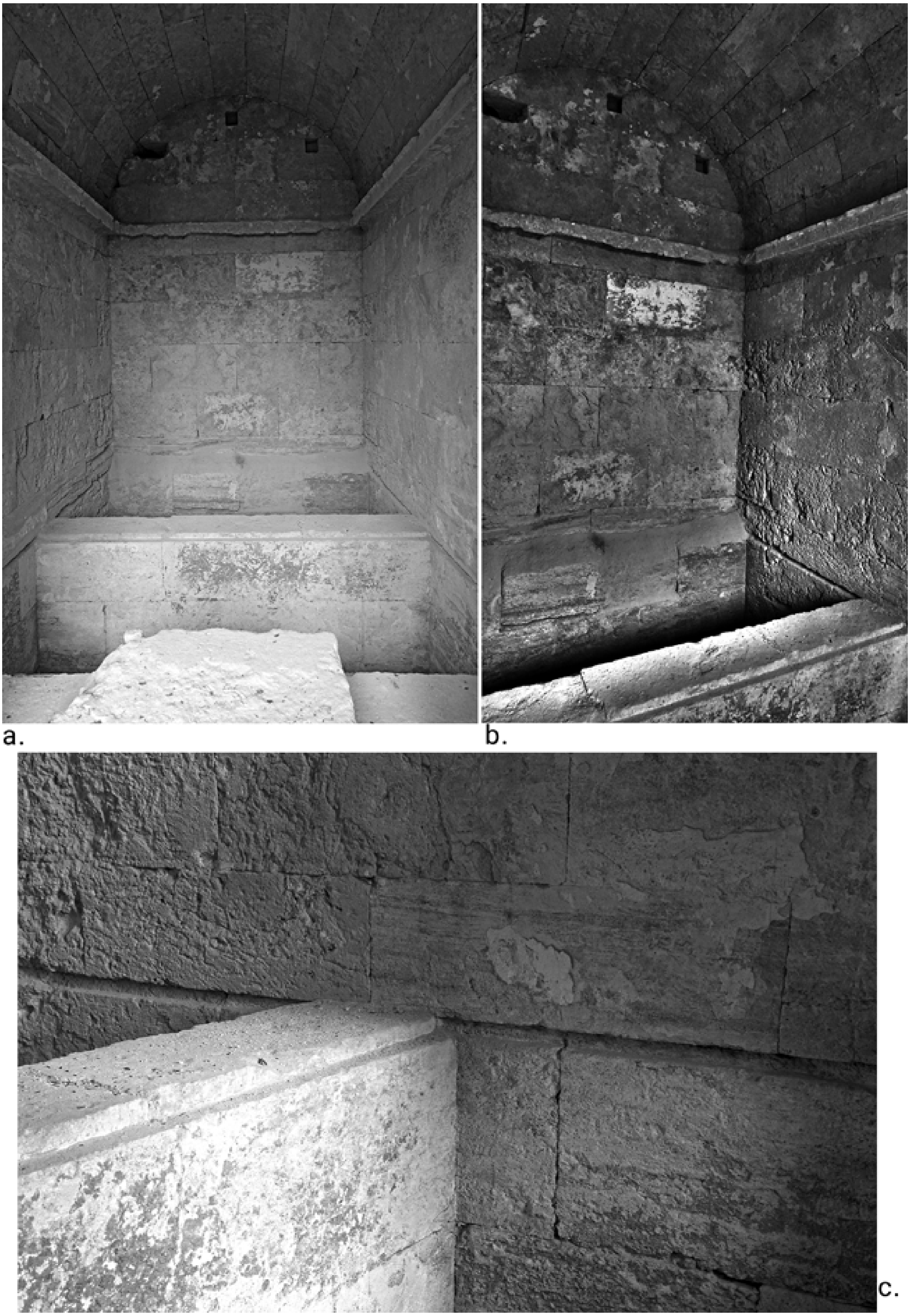

Figure 120. Analogies for the lid slit Nea Kerdyllia (Argilos Tomb II) (photos by M.M. Ștefan).

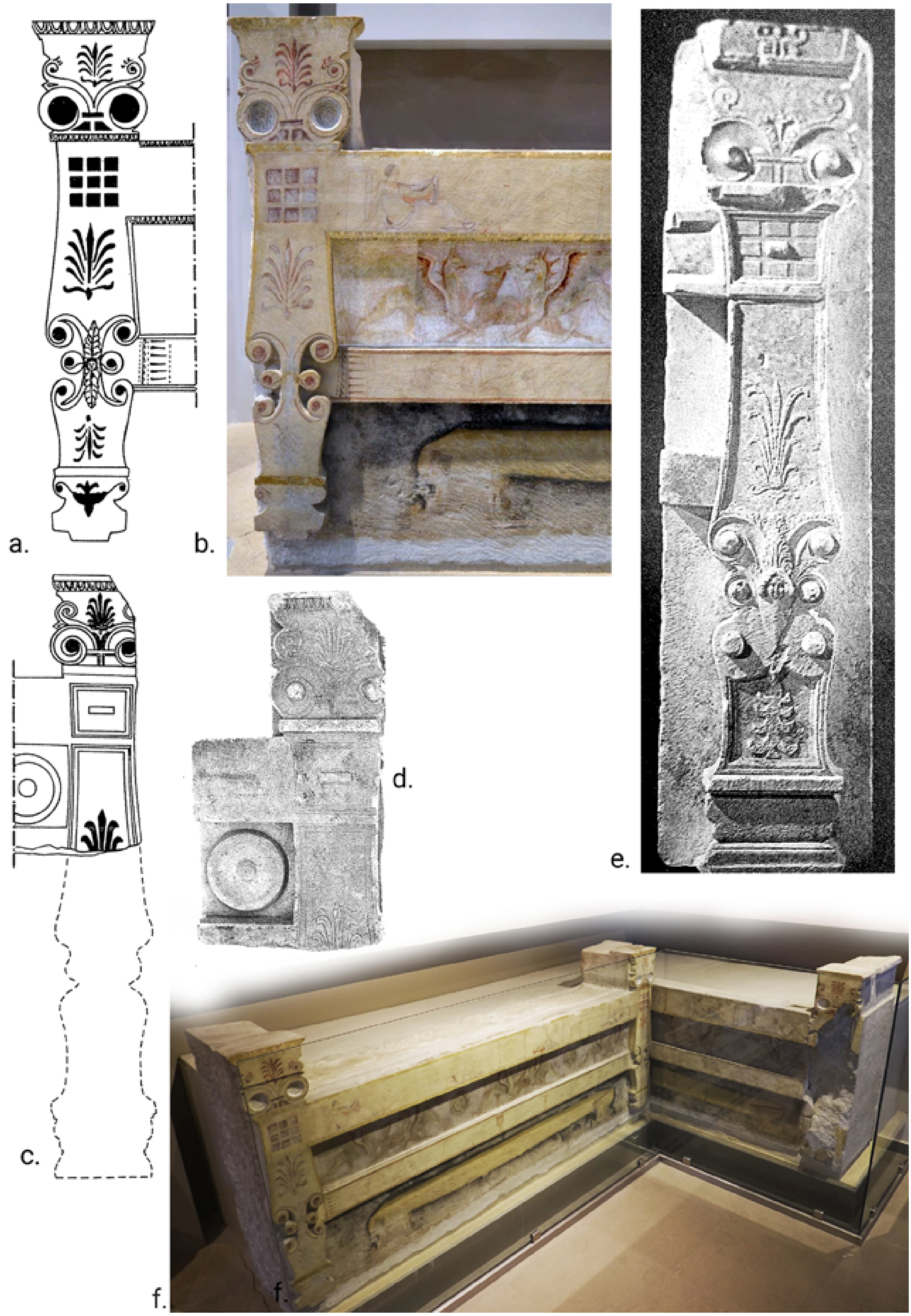

Figure 121. Analogies for the Documaci *kline* marble legs: a, b, f) Potidaea; c, d) Mesolakias Serron; e) Nea Kerdylia (Argilos) (a, c, d, e after Sismanidis 1997: 80, fig. 4 and pl. 32; b, f, photos (2019) by M.M. Ștefan in the Thessaloniki Museum of Archaeology.

A threshold block made of a single large limestone ashlar was placed in the doorway, directly over the plinths. Traces of carving in the lower part of the entrance walls, at a height of 33 cm - 34 cm, as deep as 2 cm, can be observed on both sides (Figure 123/a). The thinning of the walls was to accommodate the threshold, which was probably a little too long. Currently it lies away from its original place, in a secondary position, inclined towards the *dromos*, very probably due to the dismantling process affecting the entire funerary chamber. Excavations in trench S9 have shown that the block was pushed to make room for those digging a looting pit (Feature 4). The threshold block measures 75 cm in width, 1.17 m in length, 31 cm in height. Its side facing the chamber was white plastered in continuation of the *toichobate* register of the chamber walls. The side facing the *dromos* had a step, 7 cm high,15 cm wide, which ended on both lateral sides with what appears to be circular shallow grooves (14 cm diameter), now broken (Figure 123/c-d). Could these be holes for inserting the rotating elements of a two-leaf door? Being raised from the ground, such a holding system would be rather unstable. On the other hand, the small step of the threshold block seems appropriate to accommodate a wooden door frame, not a human foot, being very narrow. There are no grooves in the upper part of the chamber walls on its exterior (or interior either) to suggest that a door could anchor its upper pivots in these walls.

The only orifices observable, certainly intentional, regular, and grouped in two mirrored pairs, were carved in the interior of the doorway, 5 cm inside its margin facing the *dromos*. They are aligned (even if a difference of 1.5 cm can be observed due to the sinking of the entire southern wall), located at the following heights measured from the wall plinths up – 80 cm -90 cm (the lower) and between 1.46 m - 1.50 m (the upper). There are traces of an iron peg in the lower orifice on the southern side (Or 9), while those on the northern side were damaged, especially orifice 12, its parent ashlars having split from the weight forces pushing down on the lintel. These orifices seem too small to support a heavy stone or marble door, not to mention their unusual position along the entrance edge, as with doors today, not in vertical-horizontal pivots, customary for two-leafed ancient doors. Nevertheless, it seems worth mentioning that they were carved in those resistance blocks common for the *dromos*, entrance and funerary chamber (see further the discussion about T-shaped blocks) (Figures 126-127). The doorway frames, if seen in projection from the *dromos* towards the chamber, exactly half of *kline*-sarcophagus 1 (its northern half, probably where the pillow and head of the deceased might have lain), parts of register 4 (blue-black) and 5 (the upper frieze – an entire blue plate flanked by small red plates), and exactly 33 cm of the white vault.

The *dromos*, measuring in total *c.* 17.8 m, is composed of two sectors characterized by the differences in what represents the finishing of the interior faces of the building blocks, the width, height and orientation of the corridor interior space and also the implemented roofing solution. Nevertheless, both sectors were built during the same construction phase, in a clear mathematical relation one with another, with a predesigned fastening system which needed a certain prior dimensioning of some ashlars. On the southern wall both sectors shared the same plinth (Figure 128/a-b). The initial stone floor had also been taken off, during looting.

The first *dromos* segment, from the funerary chamber towards the east, was labelled *dromos I*. It measures 4.48 cm in its main longitudinal sector (on the southern wall) and 4.45 cm on the northern wall (without considering the additional steps outside the vault towards the east, on which *dromos* II was fixed). It was covered by a semicylindrical vault assembled from nine rows of voussoirs. Practically, with the voussoirs of similar dimensions (45 cm - 50 cm high/*c.* 1.5 feet; 32 cm - 33 cm wide at the intrados side/1 foot), an arrangement of four rows on each side of the arch and a key row in the middle represents a compositional half of the funerary chamber vault, assembled as eight rows on the sides and one key row. At this length (4.48 m) the vault of the corridor comes close to 13.5 feet of 0.332 m – a value which forms a ratio of 1.25, with the long sides of the funerary chamber (and its height), and of 1.5 with the chamber's short sides. The circle described by the *intrados* of the *dromos I* vault, at the western end, has its centre in the middle of the lower edge of the lintel (33/32.5 cm/1 foot above the funerary chamber vault centre). The height from this point to the *intrados* of the *dromos I* keystone is 0.815 m (the vault radius). The width of the dromos slightly varies along the courses. It measures 1.61 m in the doorway lintel lower edge sector, 1.624 m in the fourth row (which is the closest value to the double of the radius). In the area of the second blocks of the first row, it measures just 1.59 m. In the eastern end, the vault intrados is not perfectly semicircular, as the keystone row was placed poorly, leaning towards the north. The width here is 1.617 m in the first course and 1.59 m in the fifth.

The maximum height difference in the eastern part of *dromos* I seems to be 2.83 m, even if it remains less clear how the plinths lay there exactly, in the current state in which no excavations were made in that sector. Taking into consideration the total station measurements, the southern part of the chamber entrance, seen from the *dromos*, appears sunken by 1.5 cm in comparison with the northern one – hence the difference in total height.

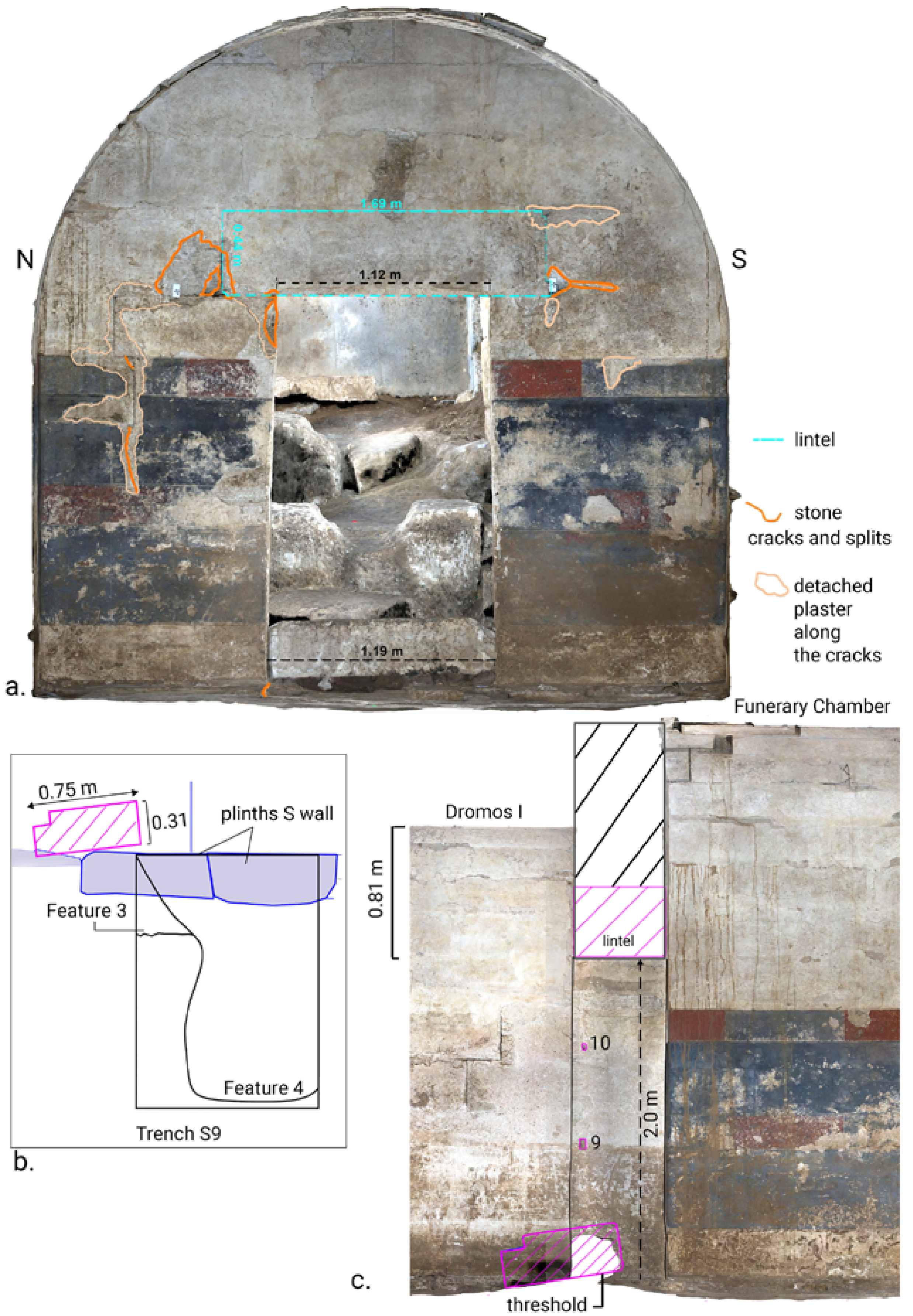

Figure 122. Entrance in the funerary chamber: a) eastern wall; c) southern wall; b) southern profile of trench S9 seen in relation with the opposite chamber wall (northern) and the threshold (orthophotos by C. Suteu, An. Teodor).

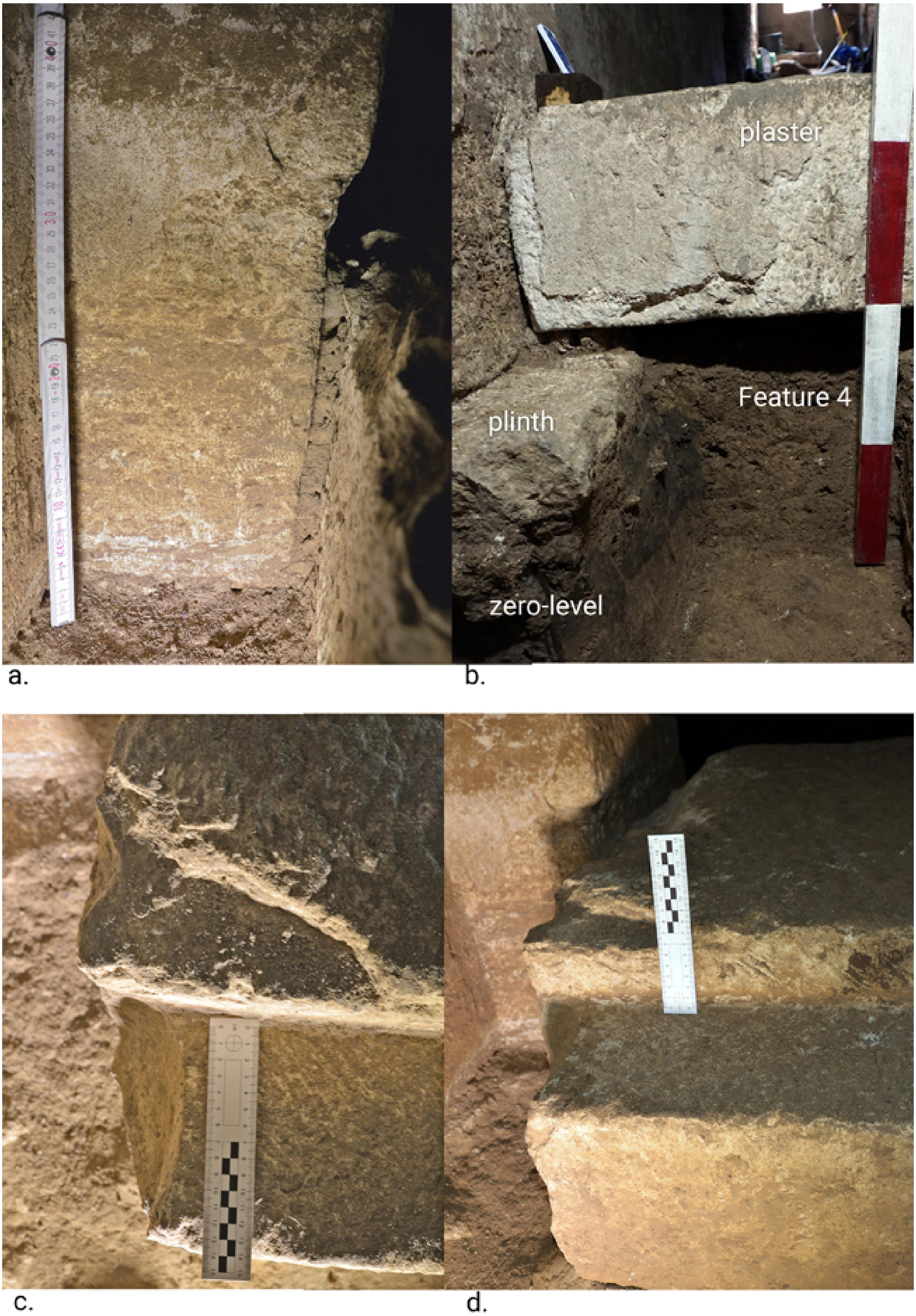

Figure 123. Threshold in the entrance in the funerary chamber: a, c, d) seen from *dromos I*; b) seen from the chamber, trench S9; a – thinning/carving the lower blocks for fitting the threshold.

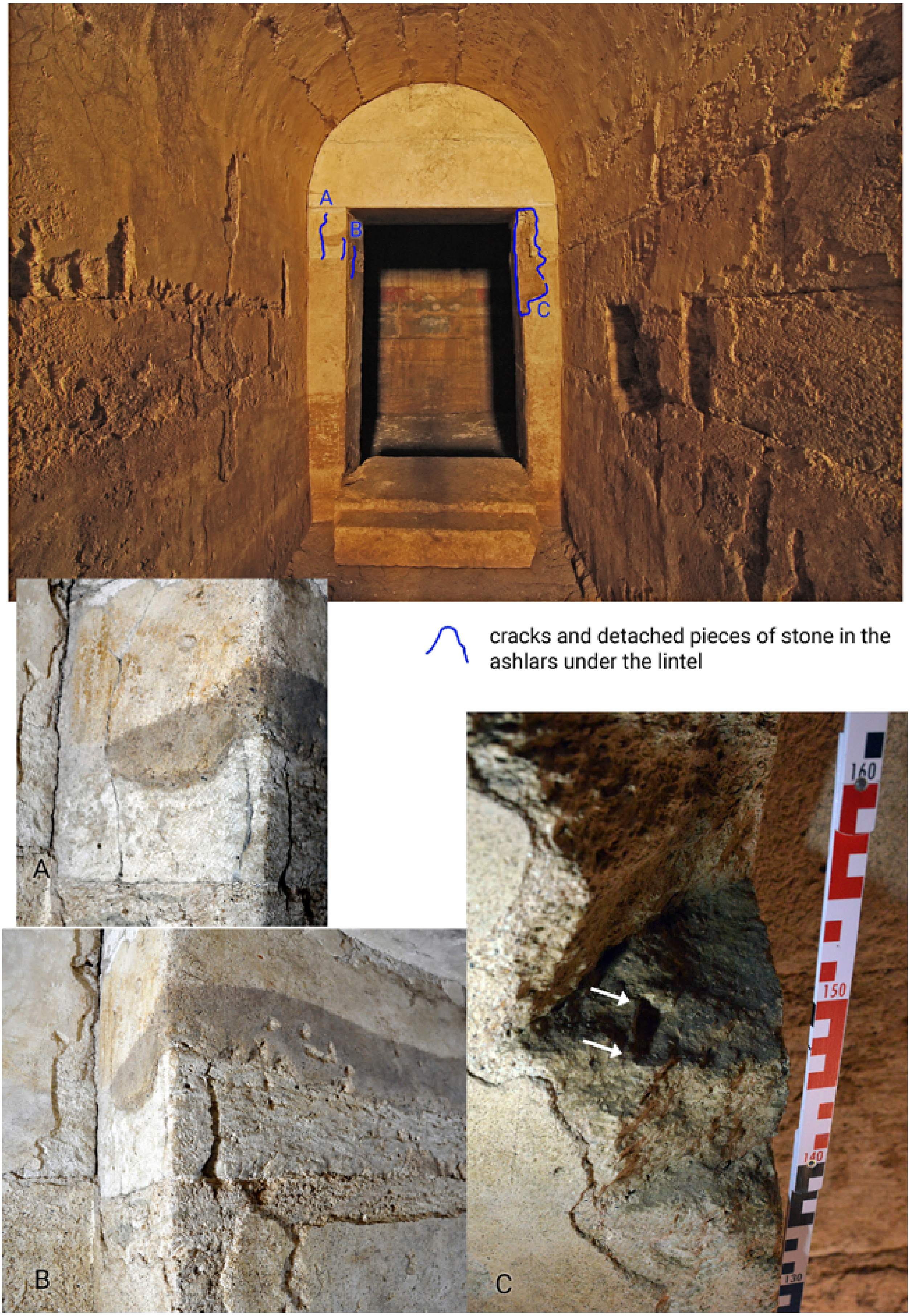

Figure 124. Entrance in the funerary chamber seen from *dromos I*. Cracks and splits in the lintel area due to weight discharge.

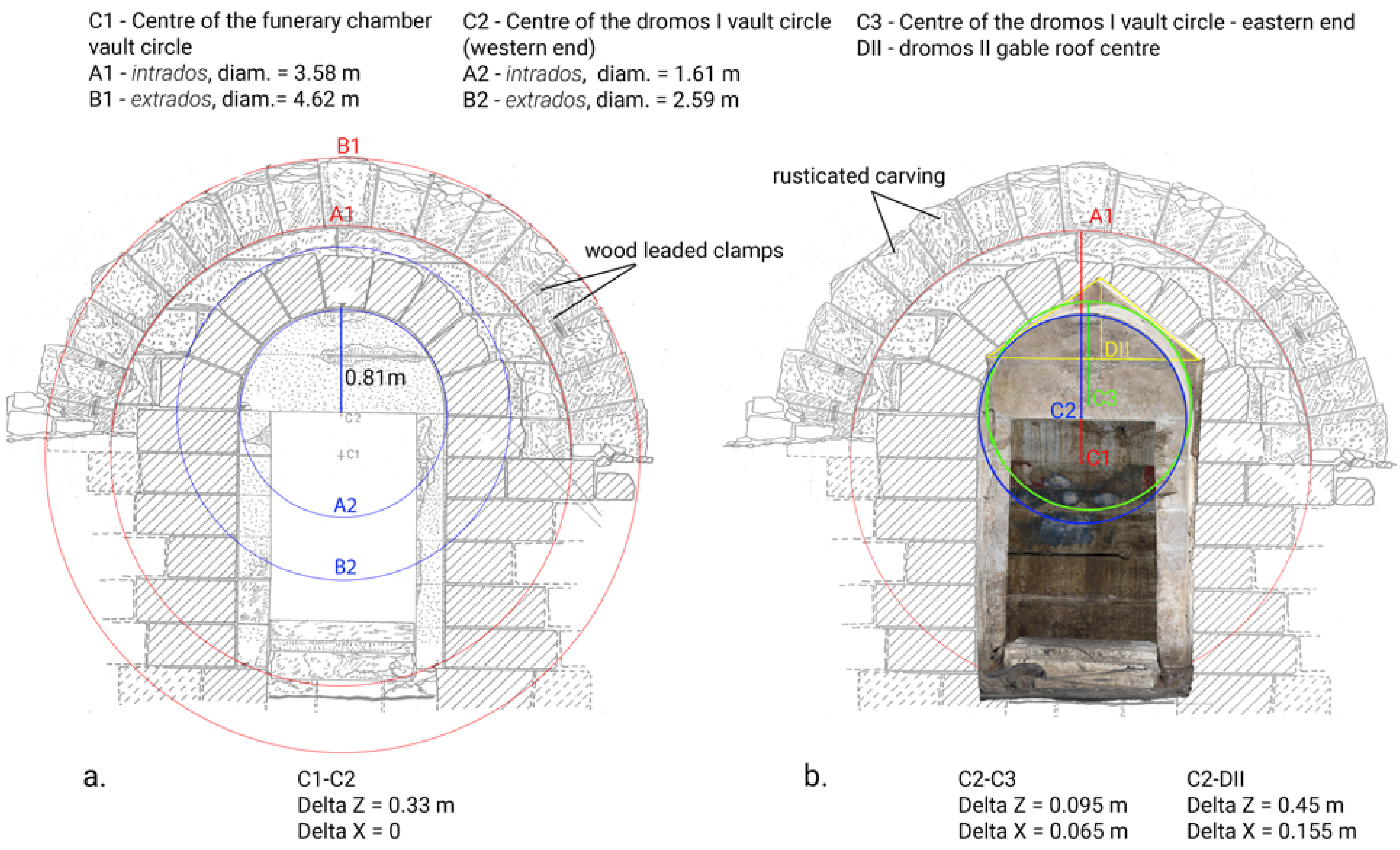

Figure 125. Vault ideal circles with deviations (analysis based on drawings A. Sion and photogrammetry by C. Şuteu). Red for funerary chamber, blue for *dromos I* (west end), green for *dromos I* (eastern end); yellow for *dromos II* (eastern end).

Figure 126. *Dromos I*, orthophoto of northern wall; orange lines – plinths and ashlars' joints visible in the areas where the plaster fell; red – T-shaped blocks common with the funerary chamber; 11, 12 show the orifices in the entrance; with blue – threshold block; dashed line – an ideal horizontal line.

Figure 127. *Dromos I*, orthophoto of the southern wall; orange lines – plinths and ashlar joins visible in the areas where the plaster fell.

Figure 128. The fastening system between the two segments of the dromos: a, b) southern wall; c, d) northern wall; 1 – zero level rising towards east, underneath the wall; 2 – common plinth for the two segments of the *dromos*, on its southern side.

Figure 129. *Dromos II*, orthophoto, northern wall.

Figure 130. *Dromos II*, orthophoto, southern wall.

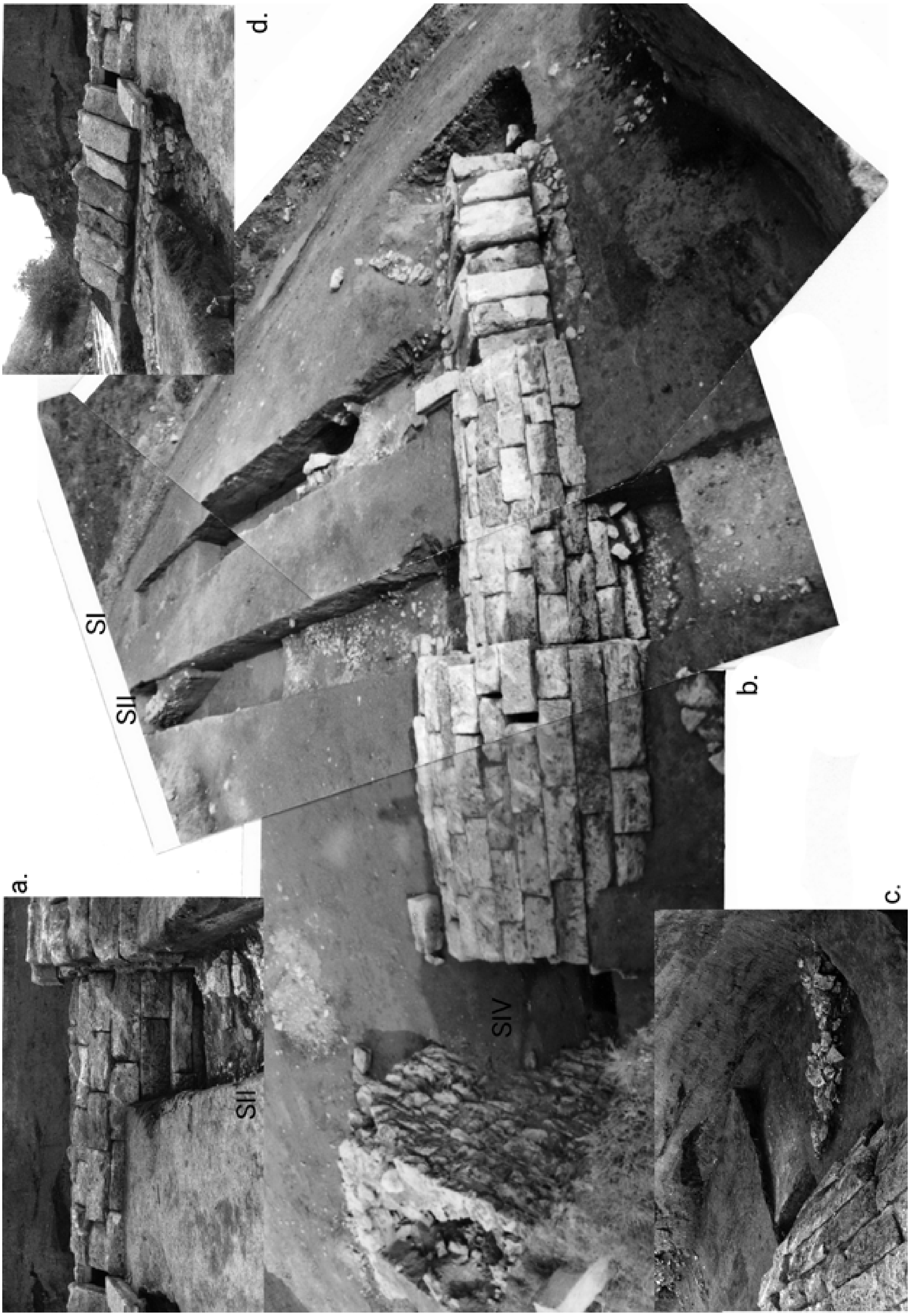

Figure 131. Photographs (1993): a, c, d) after Sion (1994, pl. V); b) by T. Bănică (Archive of the Commission of Monuments).

The eastern end of the *dromos I* vault (where it connects with *dromos* II) appears to deviate towards the north (Figure 125) away from the initial established circle, by *c.* 6.5 cm, while also raised by 6 cm. This departure towards the north was absorbed afterwards in the longitudinal axis of *dromos* II. The analysis shows, therefore, that the deviation is not just for *dromos* II (as supposed by A. Sion and V. Georgescu, and interpreted by them as an argument for *dromos* II being a later phase), but of the entire corridor. It could be a building error, even if a rather surprising one, considering the general care for accurate dimensioning seen in almost all the construction.

The contour of the *dromos I* vault *intrados* was drawn before its assembling, by the ancient architect, with red ochre pigment, on the exterior side of the eastern chamber wall, to establish for the masons the exact position and dimensions of the vault (Figure 104). Very small sectors of this line were observed by Al. Teodor in the millimetric opening of joints formed between the chamber exterior and the *dromos*, in the northern side of the vault, in those places where the plaster had fallen (Figure 104). The overlapping of the ochre markings made on the dromos vault arch laterals with the block edges was perfect. Al. Teodor had also identified a red ochre line on the wall plinths in the north-western corner of the funerary chamber, marking probably the future outline of the western wall interior face, to which the ashlars had to be carved vertical. Traces of markings with red ochre on the stone, made by ancient masons and architects, are known from Amphipolis tomb IV (Sismanidis 1997: 103), where the height of the *kline* was marked on the wall, and also from Sveshtari the 'Caryatides Tomb', where half of the vault of the funerary chamber, including the voussoirs, were drawn on the back wall of the tomb (Chichikova *et al.* 2012: fig. 90) before building. We can see at Sveshtari the same dimensions for the voussoirs (1.5 feet in height) and the arrangement based on 17 courses, as at Documaci.

The walls of *dromos I* shared T-shaped blocks[28] with the eastern wall of the funerary chamber, at least on the first row and the fifth, a situation visible at both corners (Figures 126-127). If an alternative layout were the model, as at Amphipolis IV (Perdrizet 1898: 341-341, figs. 5-8),[29] the third rows could also be common; their joints are currently invisible, hidden under plaster and thus unavailable for study. The organisation of the rest of the joints in the third row (R3) on the northern wall fits with this hypothesis, not to mention the presence of the orifices in the doorway (9 and 11) which might have been made, similar to the upper ones, also in a T-shaped block, for increased strength. These large common blocks measured *c.* 1.08 m in length (*c.* 3.25 feet).

The walls of *dromos I* were built of six rows each, assembled in isodomic style, up to a height of 2 m, on top of which the vault stood. They were completely finished with white plaster, probably polished, apparently without incised joints. The plaster has survived generally in good coverage and the stone joints are hard to observe. From the little amount available, it results that the same type of dense limestone used for the funerary chamber was also used in here, as well as the same fine carving of the ashlars. The heights of the rows vary between 31 cm and 35 cm, with the majority ranging around 33 cm - 34 cm. Several of the wall blocks extend towards the east, projecting outside the vault's arch line, forming two steps – at the level of the first course (with 28 cm projecting outside for the north wall, and 7 cm for the south) and, the sixth, under the vault (with 7 cm projecting). On these steps the walls of *dromos* II were anchored with mirrored steps (Figure 128). This fastening system ensured structural stability and also a general correspondence of the ashlar rows between the two sectors.

The second course of the north wall in *dromos I* is completely covered in plaster, while for the last (the sixth) only three stone joints can be identified. From the available joints (Figure 126) the model seems to be based on six blocks per row, at least for the rows with common elements with the funerary chamber. Row 5 has six blocks, while row 3 has visible joints for five, but the remaining length, on the eastern part, covered in plaster, is too large to be just one block. Thus six blocks for the third row too is more likely. The blocks were arranged quite symmetrically, with the joint formed between two blocks resting on a single block underneath. A good correspondence can be observed between the arrangement of the blocks of the third and fifth rows – six blocks each with joints placed in continuity between the two rows.

The longest blocks were in the first course (1.16 m, 1.10 m). The other block lengths vary in two categories, *c.* 60 cm and *c.* 83 cm. None of the rows was laid parallel with the horizontal. An elevation difference of 6.5 cm - 7 cm between the west and east ends is constant, including in the vault. This means that the *dromos* was designed to be sloping, climbing towards the exterior. The difference between the upper level of the plinths in the western side of *dromos I* and the funerary chamber is *c.* 10 cm - 11 cm.

On the southern wall we can observe the same sloping of *c.* 7 cm of the ashlar beds. On this wall the plaster is even better preserved and the numbering of the blocks

[28] Observed initially by Al. Teodor and T. Bănică.

[29] Twelve L-shaped corner blocks were used on alternate courses (first, third and fifth) to strengthen the entire built space, divided into a funerary chamber and an antechamber. The tomb was dated at the end of the 4th c. BC (Koukouli-Chryssanthaki 1976: 308).

and their dimensioning cannot be provided due to insufficient data.

The plinths under the southern wall (eight pieces) are preserved on larger widths, while the ones on the northern wall were hammered down (?), with only their segments located directly under the walls remaining. The plinths under the southern wall measure 50 cm - 66 cm in width and about 20 cm in thickness. They have sunk on their southern side due to the wall's weight and vault discharge, rising their opposing end, the northern, by *c.* 5-6 cm. This observation can be corroborated with the entire sinking of the southern wall by 1.5 cm. The plastered area on the walls stops c. 3 cm - 4 cm above the plinths – similarly to the funerary chamber, where clues existed that in that space the plastered floor was fitted. This might mean that the floor of *dromos I* could also have been plastered.

Particular to *dromos I* are the graffiti of ships, horsemen and wild animals scratched in the dried plaster, in the upper part of the walls and at the base of the vault (Figures 169-174). They are described by Oana Damian in Chapter 11, and dated around the 10th c. AD. The raised position on the walls relates to the elevated walking level due to soil accumulated inside (a deposit 1.10 m - 0.80 m thick), following the dismantling of the *dromos* entrance during the Late Roman period.

***The Dromos* II sector** was covered with a gable roof composed of pairs of opposing slabs placed at angles of c. 37° - 38° degrees to the walls (Figures 129-130; 133). Eight pairs of various widths, ranging consistently from 48 cm to 82 cm (measuring *c.* 30 cm in thickness, 1.25 m - 1.26 m in length, creating an interior isosceles triangular space with lateral sides of *c.* 1 m), are still *in situ*, along *c.* 4.5 m. This length, still preserved in complete elevation, was closed in the 1990s, first with a metallic door and then with a concrete one. Remains of the dismantled *dromos* II walls (specifically its northern wall) were known since 1993 to continue for *c.* 1.65 m more, underneath the concrete door foundation (Figure 94). The recent excavations at S1/2017-2019 and S8/2018-2019, have completed the data, providing reasons to allow us to consider that *dromos* II had measured, initially, 13.4 m in length (exactly three times the length of *dromos I*). The last 6 m of its eastern segment were dismantled completely since antiquity; only the foundation ditches for the walls were discovered, parts of wall plinths, and some of the stone pavement in front of the *dromos*, a component of the circular zone that surrounded the entire mound (Figures 146-148).

The elevation difference between the most eastern plinth of *dromos* II and the exterior pavement is 20 cm, implying that *dromos* II was also built sloping. Also in *dromos* II none of the seven rows was built horizontally. In the most western sector of *dromos* II, preserved in complete elevation, the difference in horizontality of the rows is 4.5 cm - 5 cm. The horizontal joint lines of *dromos* II correspond largely with the beds of *dromos I*, taking into account the slope and also a greater variation in row height. The additional seventh row compensates the height difference between the gable roof and *dromos I* vault. The heights of the rows are, from bottom up: 35 cm, 35 cm, 35 cm, 28 cm, 35 cm, 32 cm, 40 cm. The slope of the ashlar beds was obtained by setting the desired levelling in the black beaten soil placed under the plinths (Figure 128/c). In a single case, in the northern wall, the lower horizontal line of course six was interrupted for a step joint (Figure 134/a). The joints of the second and fifth rows correspond, as well as those of the third and sixth.

The largest block of *dromos* II measures 1.23 m, while the smallest reaches 0.55 m. The majority range in intervals between 80 cm - 100 cm. The most massive ashlars were used in the seventh row, the one that supported the gable roof, in which the longitudinal V-shaped grooves were carved, to accommodate the roof slabs (Figures 129-130). These grooves measured *c.* 15 in depth and 19 cm in width (Figure 133/b, e). The roof slabs had their margins joining to form the pitch of the roof, cut in an angle to form a horizontal joint line. This technique, with the use of V-shaped grooves, has its only analogies in a series of six tombs from the second half of the 4th - 3rd c. BC in Olbia (Papanova 2006b) (Figure 132).

Dromos II measures 1.58 m in width on the western side, and after 3.75 m it already reaches 1.51 m (fifth row). In S8, the width between the foundation ditches was 1.46 m. The height of the walls is 2.40 m, to which the roof interior adds 58.5 cm more. (2.985 m = 9 ancient feet).

Besides the gable roof, the striking feature of this funerary compartment is the unfinished look of the walls, not only left unplastered, but also roughly worked. The walls were built of rusticated ashlars with slightly bevelled edges, giving a sense of three-dimensionality. Several blocks had rectangular carvings along their edges (Figure 134/b), possibly used during their manipulation and setting in place, with the use of crowbars.

Only in the area where the two *dromos* sectors join, can *dromos* II be seen in its entire elevation; the soil deposited in antiquity has remained unexcavated, rising to a maximum of 1.4 m under the concrete door (covering the first four rows of ashlars). Several massive pieces of carved limestone can be seen in this deposit – at least five – currently used as steps allowing access inside (Figure 135). Two parallelepipedal blocks, with all four faces roughly carved (thickness 20 cm), are

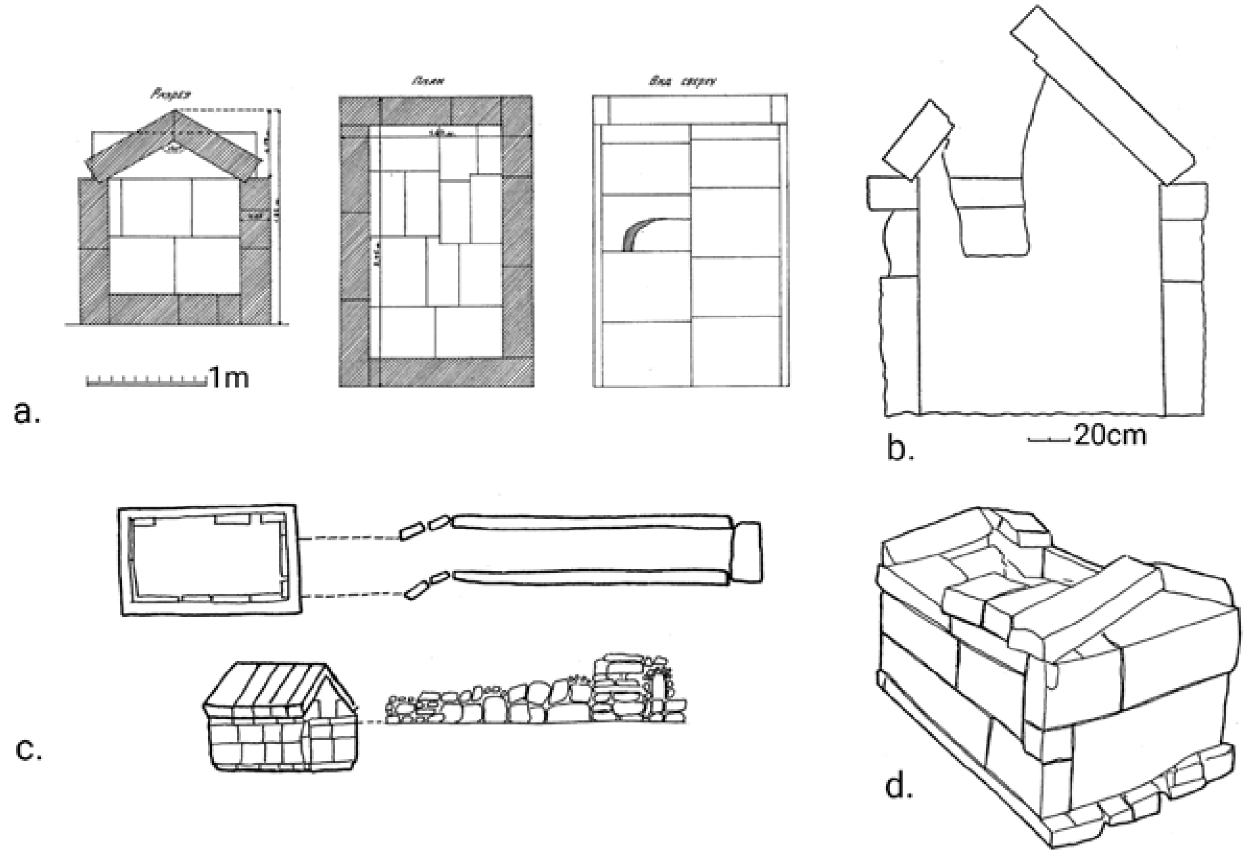

Figure 132. Tombs at Olbia (second half of the 4th - 3rd c. BC) featuring gable roofs of slabs fixed in V-shaped longitudinal grooves (after Papanova 2006b: 116-117, fig. 47.2, 48.1).

currently in secondary position. A 1994 photograph by A. Barbet (Figure 135/a) shows how they were initially found in relation to a massive stone with a semicircular carving, placed transversally in the *dromos* II. This block is still in its place, but the two slimmer ashlars, which stood vertically on it near the *dromos* walls have collapsed (Figure 135/b-c). The entire arrangement was fitted to form a kind of entrance in the tomb, of secondary date, obviously built on top of the remains of the dismantled corridor, probably linked with the period when the tomb was used for certain activities during Late Roman times.

Excavations in the entrance are of *dromos* II

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The *dromos* of the tomb is currently standing in complete elevation for just 9.8 m, meaning that no more than 4.4 m - 4.6 m of its second sector, covered with gable roof, can be seen today. The easternmost preserved end of the *dromos* was blocked with a concrete door *c.* 1999 (Figure 137/b). Nevertheless, it was known already since the earlier excavations, recorded on Sion's plans, that the lower two courses of the northern wall continued, underneath the concrete plate, for an additional 1.65 m (Figure 94). In the same documentation, an oval pit, 3 m in diameter and with Late Roman materials, was recorded as supposedly piercing the *dromos*. These data were theoretically obtained in trench SIV/1994, the exact layout and dimensions of which are not entirely clear, but they surely covered a part of the dromos northern wall and part of retaining wall Z6. Starting from 2017, this area was reopened in the search for the entrance in the former corridor, and also to establish the relation of the tomb floor's absolute values with the exterior ancient surrounding terrain.

As the recent excavations in trenches S1, and especially S8, have shown, the *dromos* continued further east, at least until it reached the supposed outline of the exterior pavement, 17.8 m (in this hypothesis). Of the former *dromos*, only parts of the plinths remained, or the bottoms of the foundation ditches, slightly deepened in the black construction level and filled with yellow clay. The 'looting pit' mentioned in Sion's plan proved to be, in fact, the fingerprint of the dismantled part of the corridor. It seems thus, that during the ancient dismantling of the corridor, only the ashlars were removed, while the lateral segments of the embankment remained standing by themselves,

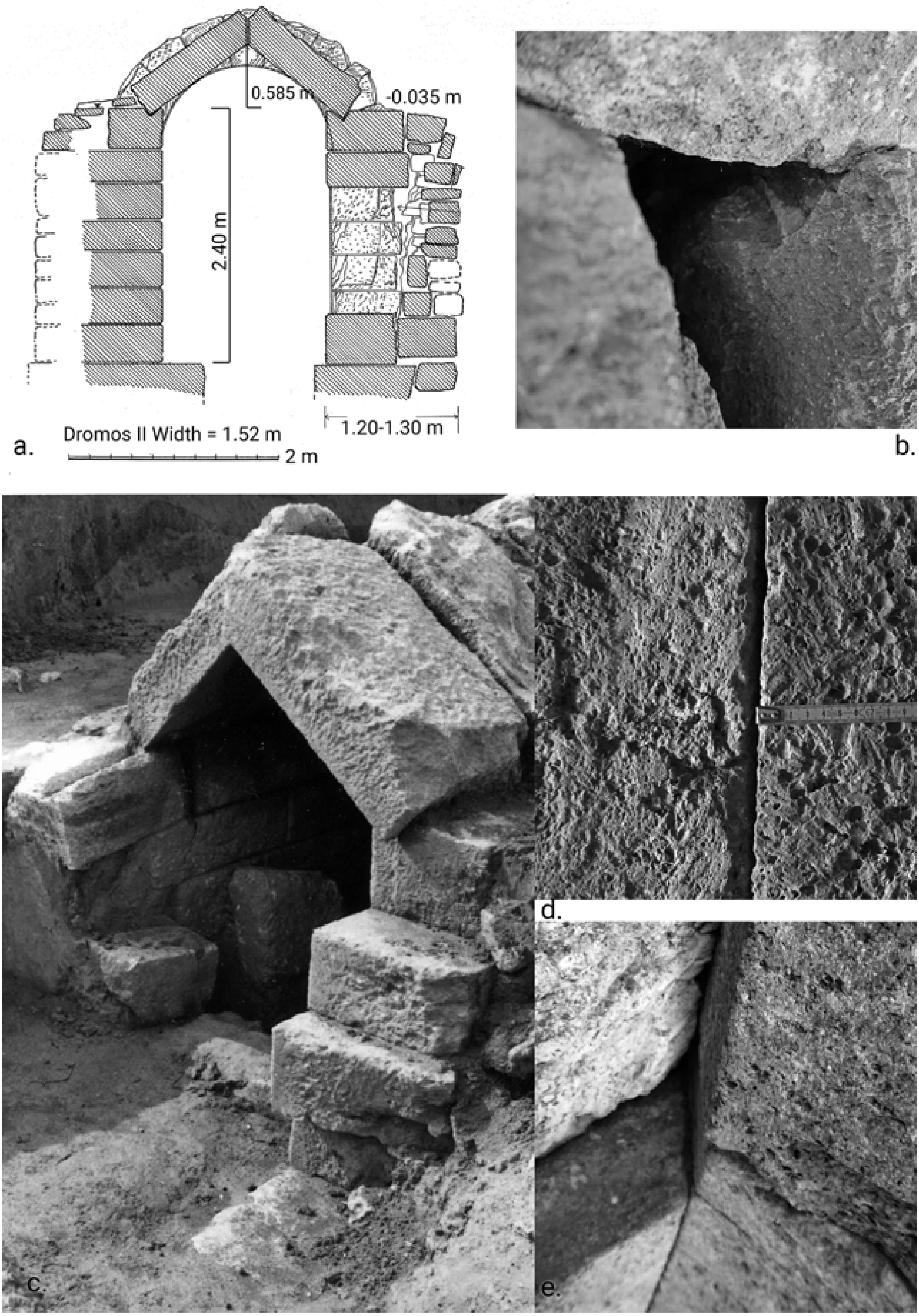


Figure 133. *Dromos II*: a) after a section by A. Sion; c) image 1993 by T. Bănică; b) detail of the V-shaped groove; d-e) interior faces and joints of the roof slabs (d – lateral, e – superior).

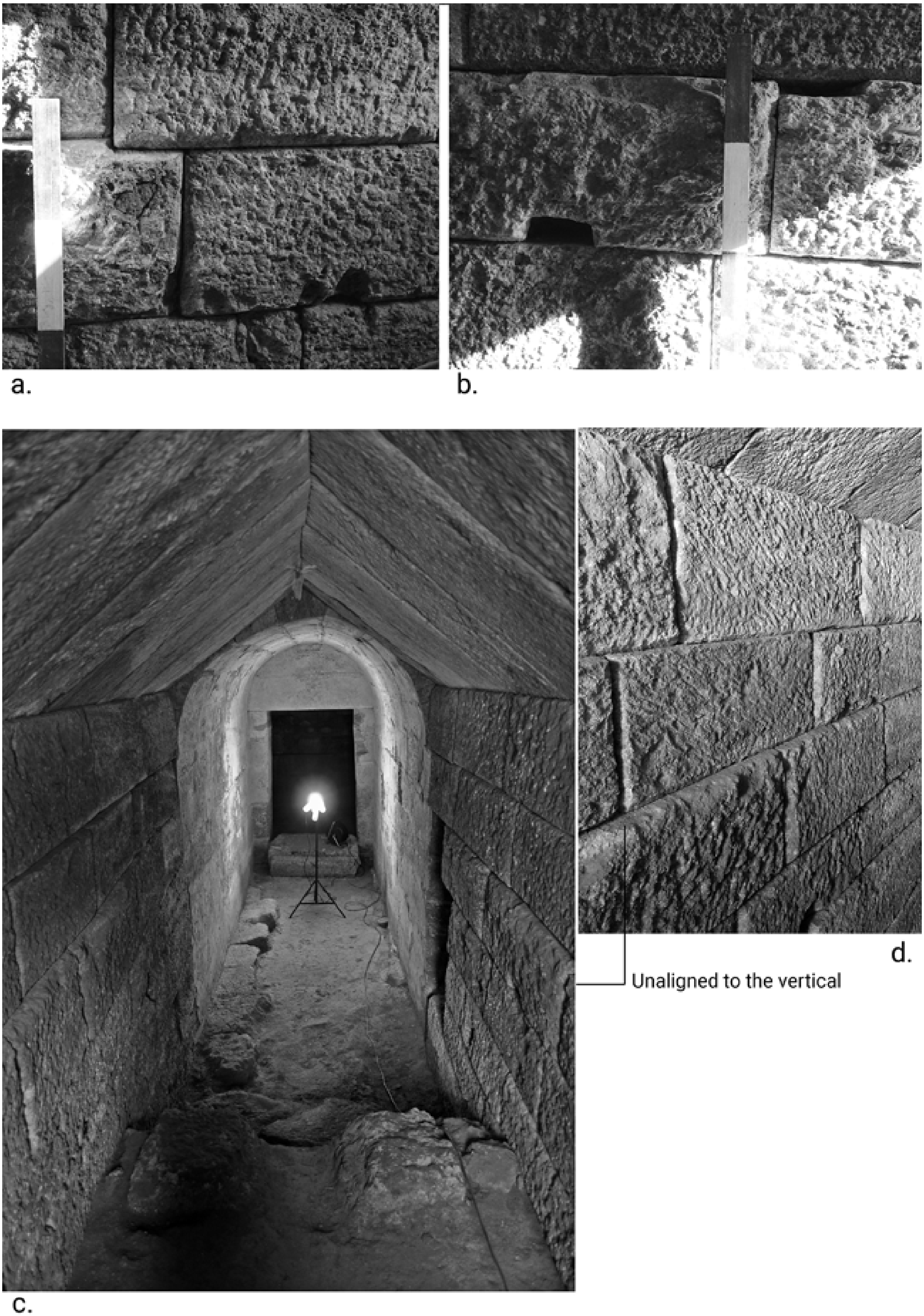


Figure 134. *Dromos*: a-b) details of *dromos II* north wall; c) entrance to the funerary chamber seen from the level of the concrete door (photo by Al. Teodor); d) *dromos II* southern wall (photo by D. Ștefan).

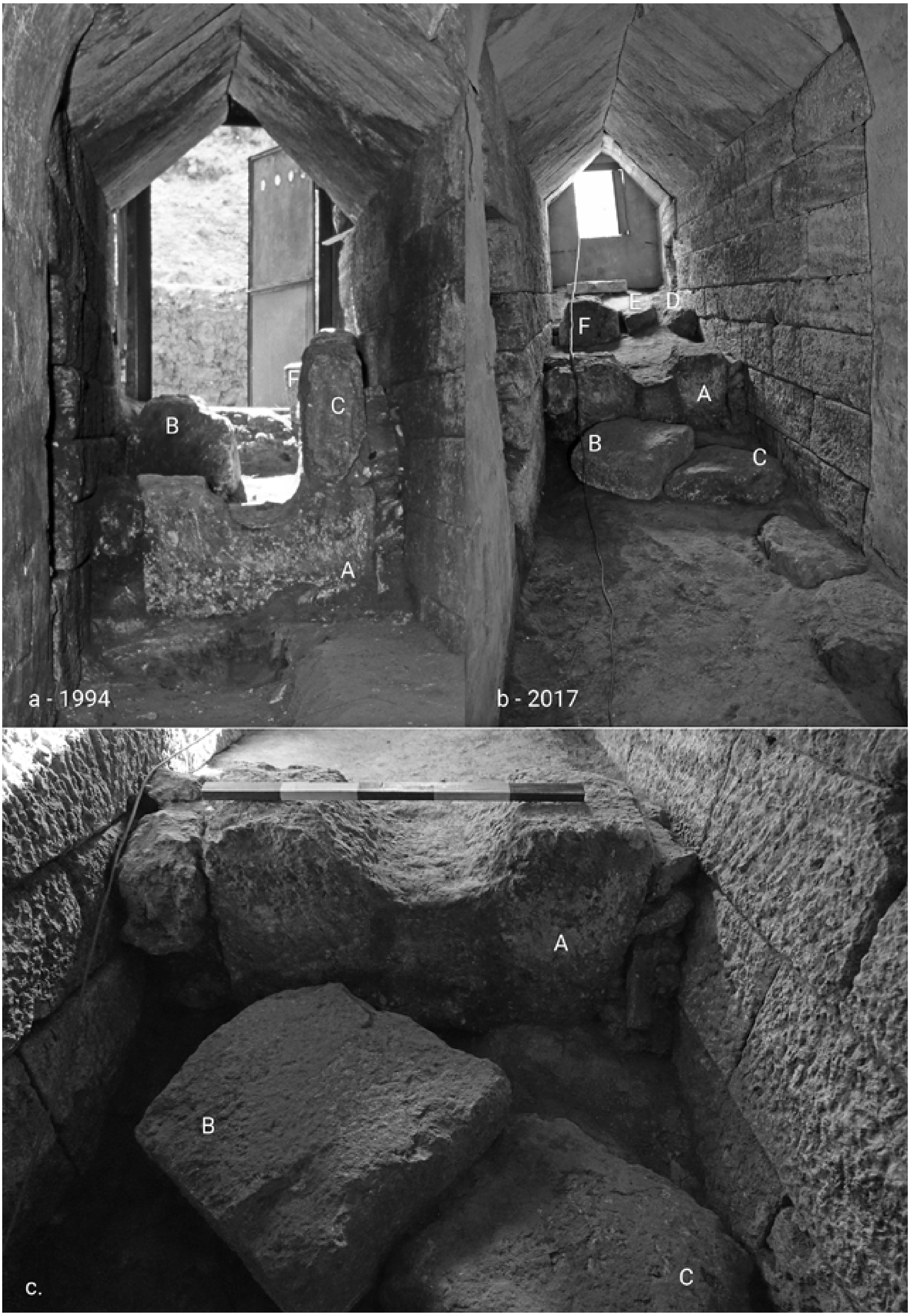


Figure 135. *Dromos II*, east-west: carved blocks in secondary position fixed on top of the Late Roman period layer (a photo by A. Barbet 1994).

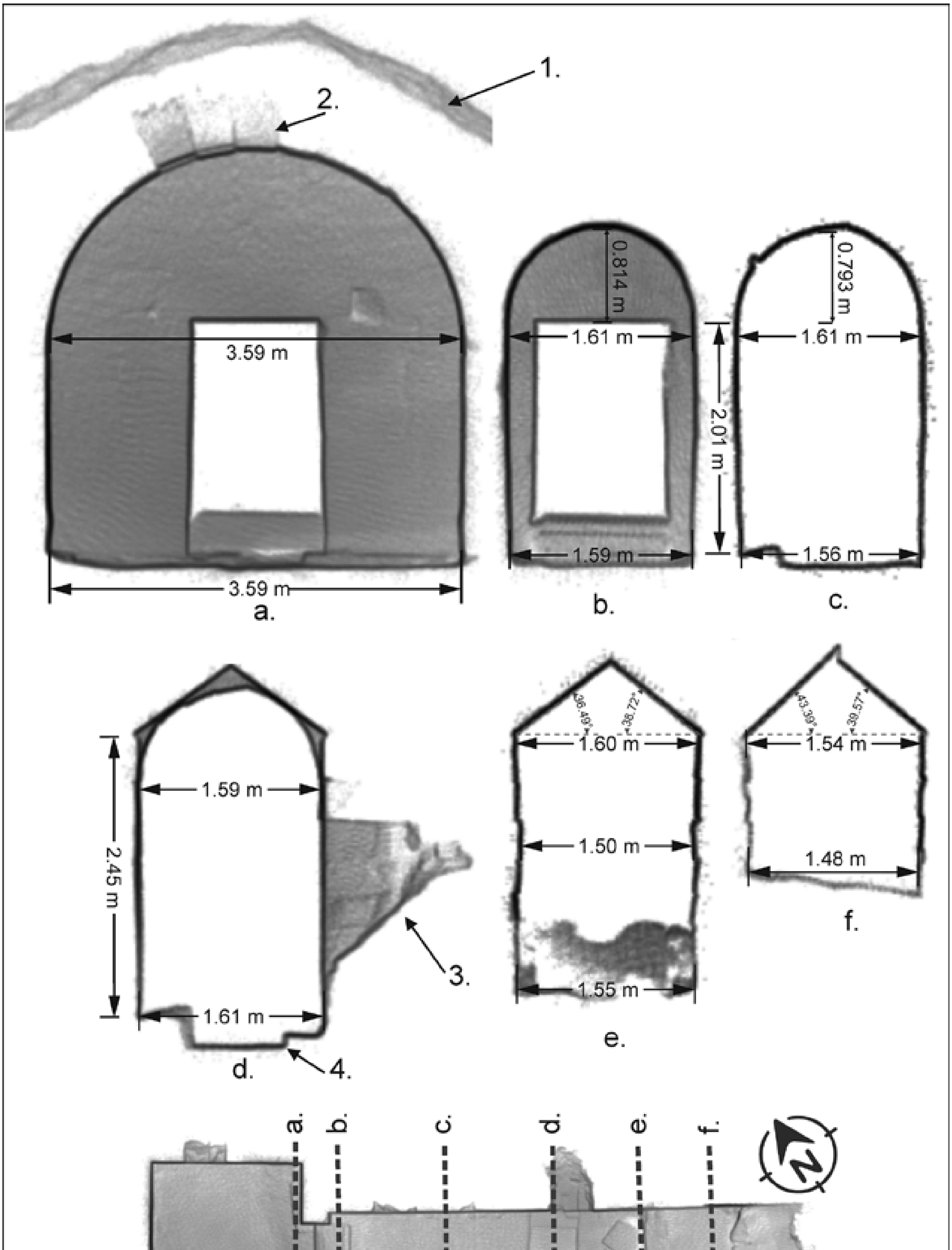


Figure 136. Vertical sections calculated on LiDAR data (by D. Ștefan); 1) modern soil tomb cover; 2) displaced voussoirs; 3) dismantling to the northern wall of dromos I; 4) 2020 excavation (unfinished and not mentioned on the general plan).

preserving the initial building stratigraphy of the mound.

The excavations in trenches S1 and corridor S8, in the eastern sector of the mound, were not large, but did prove quite valuable for their contribution to revealing a complex stratigraphic sequence, the most complete of the entire site, down from the 1993-1995 digs to the start (moment 'zero') of the tomb's construction, after passing through all the secondary interventions of the modern and then Late Roman periods (5th-6th c. AD). The excavations were limited towards the east by the presence of the military dyke. S8 (4.5 m x 2.5 m, opened along the dismantled *dromos* longitudinal axis, at 4 m east of the concrete door) developed along the maximum available terrain length. Any extension towards the east or on the laterals, where the *dromos* connected with the *krepis*, will be very difficult in the future, administratively and technically, as they will overlap army property.

The construction features of the walls of dromos II

In terms of the discoveries in the 20m long trench S1, opened perpendicular to *dromos* II, we have already mentioned some details when discussing the tumulus embankment and support walls for the tomb's structure (Chapter 6). The excavations here evidenced that the walls of *dromos* II were inserted in foundation trenches, the exterior sides of which were carved *c.* 1 m deep in the margins of the two previously and symmetrically heaped soil monticules used in the embankment construction. These monticules were continued upwards, after the first two or three courses of *dromos* II were laid in place, by adding layers of stones, some continued in the shape of retaining walls, and placed at *c.* 45° to the corridor walls, alternating with layers of beaten soil (Figures 68-71), once the *dromos* masonry continued. Fine layers of limestone dust were also identified in the exterior of *dromos* II walls, in the composition of the southern monticule, suggesting that the final dressing of the ashlars had taken place *in situ*.

The foundation trenches had slightly rounded bottoms, deepened for 2 cm - 8 cm in the beaten black clay, representing the construction level. Their fills were beaten yellow clay, mixed with crushed limestone fragments. Very small fragments of charcoal (burnt wood) were observed mixed in this yellow clay filling. The wall plinths were placed over this fitted base. The symmetry of the previously arranged monticules, with each of the centres located at *c.* 7m - 8 m on both sides of the dromos walls, the fact that only their lateral margins were cut, and the corelated building of their upper elevations with the *dromos* masonry, all demonstrate that the anteriority of the heaped monticules should be seen as part of a chain of constructive operations, not as a different building phase.

The same model can be recognized in tomb T3, excavated previously at 2 Mai (Preda 1962) and discussed in Chapter 3.4. Its excavator interpreted the *dromos* pit as an indication that the tomb was built in an older mound. However, we can notice in the published profiles the existence of a construction level of dark colour (there labelled as ancient humus), on which both the *dromos* and lateral monticules were built. It seems more probable, however, in the light of the results at Documaci, that the lateral soil ramparts at the 2 Mai tomb were heaped before the lower part of the wall masonry, but symmetrically in relation to the projected *dromos* layout. Only the exterior sides of these monticules were cut to insert the walls. This indicates that an open space existed between the monticules when they were cut. Overall, this building method seems a hybrid construction technique, mixing Macedonian and Thracian approaches of relating masonry to the natural terrain and surrounding embankment.

The foundation trenches for the *dromos* II walls allowed the building of two 1.20 m - 1.30 m wide masonry lines, of dressed large blocks, facing the interior of the corridor, and with less well-dressed stones placed towards the exterior, arranged in the manner of a coating or filling, raised up to the edge of the vertical walls, under the gable roof. The ashlars were carved on all faces, but the back one. The blocks and slabs placed at the back of the faced ashlars, even if less dressed were still laid in a neat arrangement, corresponding by and large with the masonry rows (Figures 131; 134). This is especially clear on the southern *dromos* wall, the width of which seems made, in fact, of two rows of blocks *c.* 58 cm - 54 cm wide. This exterior part of the walls was designed either as a filling for the space between the ashlars facing the corridor interior and the margin of the foundation ditch, or, if higher on the wall elevation, was continued with lateral retaining walls included in the composition of construction monticules. The masonry of these lateral retaining walls was intertwined with the back filling of the dromos II walls. The interconnected building style ensured a solid framework for the corridor, which could be thus strongly fastened with the surrounding embankment soils. Only a large block (48 cm high, 72 cm wide), almost cubic, was preserved on the northern wall. It was laid directly on thin plinths (30 cm long, 10 cm thick, projecting towards the corridor interior). The southern wall was laid over a much thicker base, of almost the same height as the first course (blocks 40 cm high, 54 cm wide).

Repeated activity in the tomb's entrance area

In trench S8 we cut through a thick deposit (2.6 m) which preserved the remains of repeated activity in the tomb entrance area: dismantling episodes alternating with periods of desertion and even elements of habitation (pits, clay floors for surface structures).

The stratigraphy in S8 can be divided in three main parts (Figure 143). The latest, measuring 90 cm - 1 m in thickness, involves several modern interventions (from latest to oldest): soil deposited during the 1993-1995 mechanized excavations (labels 1A-C in Figure 143); 1993-1994 archaeological trenches (1); trench for an irrigation/sewerage pipe, filled with stones removed from the site (2); terrain levelling and layered heaping for the military dyke (3A-C). Sometime before the dyke, the destruction of the mound's summit and socle has to be introduced – as the connection with the S1 stratigraphy shows (where the 1993 pit cuts layers 3-5 in Figure 142).

The second main part of the stratigraphic sequence includes five overlapped layers observable on the northern and eastern trench walls (only three of them on the southern trench wall) (labelled 4 and 5A-D in Figure 143). Their main characteristic is the horizontalized aspect. They resemble a regular stratigraphy in a long-lived settlement. They all contain fragments of Late Roman pottery. The latest layer is the thickest (*c.* 30 cm). It is an homogeneous, textured, chestnut-coloured loess, with only few materials and small stones. This could be the soil accumulated during the long period of desertion since the last coherent activity on site until the modern era. It can be found approximatively 2 m above the initial construction level. A pit (feature 7) observed in the south-eastern corner of the trench had a rounded profile and flat bottom (75 cm deep); it pierced layer 4. The pit did not contain materials, yet seemed, nevertheless, an old one. Underneath deposit 4 the following four layers were thinner (15 cm - 5 cm). They were observed along a 3-m length (east-west). Among them, 5C (absolute elevation 44.80 m) was represented by a layer of compact yellow, clean clay (feature 8), associated with a small circular post pit (feature 9, 15 cm diameter), in all probability the remains of a surface structure (Figure 145/a). The lowest (earliest) of the group, 5A, contains fragments of broken stones. On the southern trench wall it can be seen descending until above the base of the former *dromos* wall. It can be interpreted as a last dismantling activity. All these layers contained basically Late Roman pottery.

The third group of layers is essentially related to dismantling episodes (7 in Figure 143), separated by periods of desertion during which soil gathered (6, 8, 8A). After an initial dismantling, which removed the slab floors and the upper courses of the walls, a soil layer (*c.* 40 cm thick) was formed on top of the initial construction level, which here was not disturbed (as opposed to the funerary chamber). This accumulation was consistently compacted and had a characteristic reddish colour, not comparable with anything else in the built embankment. It was observed occupying the entire length and width of the dismantled *dromos* II sector, including in S1. It was overlapped by a dense layer of chipped stones, resembling a primitive floor. We labelled this layer as a Late Roman walking level (II), recorded at an elevation of *c.* 44.10 m - 44.20 m. It went further west in S1 and into the roofed segment of the *dromos*, underneath the concrete plate. Its defining characteristic was that the chipped stone covering was limited just to the former *dromos* interior, not including the layout of the dismantled walls. This suggests that the walls were not completely dismantled at the time people walked on the chipped stones.

An earlier layer of chipped stones (*c.* 20 cm below the previously mentioned one) was observed in S1, partially overlapping the first course of ashlars on the southern wall (level I, *c.* 43.90 m), confirming that the lowest course was in place at the time people walked on the central pebble pathway, but the rest of the elevation was missing.

On top of the latest pebble pathway were scattered (especially in S8) large, dressed, cuboid ashlars, parts of the initial masonry of the *dromos* walls. These blocks were in their turn covered with a layer of soil containing a very large quantity of broken stones (layer 6), which descended abruptly towards the east, right down to those slabs marking the *dromos* entrance, an additional argument for considering them part of the exterior pavement. Layer 6 contained Hellenistic material in secondary position connected with the dismantled dromos, or even with the initial funerary inventory.

The pavement of slabs in front of the entrance

A pavement of 17-cm thick slabs was identified in the eastern margin of S8, occupying the entire trench width (2.25 m) (Figures 144; 146; 148). They enter under the northern trench side, but apparently not also under the eastern one. The slabs seem to belong to two different structures: a north-south alignment consisting of six main pieces (some made up of several fragments, either fragmented in time or composed from the start as a puzzle) and an east-west alignment (two slabs) corresponding to the interior margin of the former southern wall.

These latter slabs appear made of a denser limestone and have more pronounced polygonal shapes. They measure 51 cm x 45 cm and 67 cm x 52 cm and were arranged with their longer sides perpendicular to the walls (north-south). They could be the plinths for the southern wall. An axis connecting the interior of the *dromos* II dismantled wall in S1 and the segment preserved in elevation touches exactly the northern margins of these slabs.

The north-south alignment of slabs looks instead like a belt, *c.* 60 cm wide, with regular margins (east and west); the composing plates were cut more squared, and the limestone was obviously finer, softer, whiter, like chalk, and similar to the plates identified in trench SIII, in the pavement surrounding the *krepis* wall. They measure 52 cm x 34 cm, 57 cm x 55 cm; and 60 cm (north-south) x 79 cm (east-west).

The absolute level on top of these slabs is 43.74 m, compared to 43.43 m - 43.44 m in the burial chamber. The difference in level of 30 cm, between the burial chamber and the end of the corridor near the entrance, means that the access was practically very close to the exterior terrain. This elevation difference, corresponding with sloping courses in the *dromos* construction, preserves nevertheless the idea of a descent. The sloping of the dromos masonry was ensured with the initial setting of the construction's level zero, with dark beaten clay.

The plinths preserved in S8 for the dismantled northern wall (three fragments) were located 10 cm lower than this pavement. They appear much thinner than those for the southern wall, a difference between the walls observed in S1, too, as well as in the roofed segment of the corridor.

The lower limits of this secondary intervention corresponded with the ancient excavation for the foundation trenches of the walls, while the upper limits, observable as clearly defined straight margins, corresponded with the initial, firmer interface between masonry and the built embankment. Thus the embankment was not disturbed, and it remained standing for a good while after the ashlars were removed from the walls.

Analysis of the constructive stone elements in Documaci tomb

Valentina Cetean

Both the funerary chamber of the Documaci tomb and the *dromos*, with its two distinctively built sectors, were made of several varieties of limestone, belonging to the categories described in Chapter 10. Three geometric shapes were observed: a) limestone ashlars, mostly parallelepipeds; b) blocks with curved sides and trapezoidal profile (*voussoirs*); and c) slabs (the category where the width exceeds at least twice the thickness).

The voussoirs were used to assemble the semi-circular vaults of the funerary chamber and *dromos I*. As the *extrados* was inaccessible, and *intrados* covered in plaster, observations were limited.

The ashlars are the composing elements of the walls, their arrangement being made without binding materials, but only by overlapping, resulting in almost equally sized rows. Such a good connection could be achieved due to the advanced degree of processing of the blocks' horizontal sides. There are rarely distances greater than 1 mm - 3 mm between the rows, in the visible area. As for the lateral walls of the blocks, they seem less well processed, the joints, due to differences in flatness, reaching 3 mm - 5 mm.

Slabs were used to make the V-shaped roof of *dromos* II, and probably the floors of the tomb, nowadays completely lost. In Figures 131 and 135 their shapes can be observed following the investigations of 1993-1994. A characteristic visible only in these photographs, and in the sketches made in that research stage, is the difference in thickness of these constructive elements: in the case of blocks, it can equal the size of the width, while the length is always almost double that of the masonry blocks. The block surfaces that were intended to be covered (hence not visible) have a variable degree of processing and straightening. Some achieved a good degree of flatness, especially the extreme eastern elements, while others have significant differences in thickness, up to 10 cm - 15 cm for a block used on the roof of *dromos* II. However, the level of processing of the exposed faces is high, regardless of the porosity of the rock from which they were cut (which obviously varies, without reducing, at least visually, the high appearance of compactness).

The significant massiveness of the stone elements, and the construction techniques applied, show the obvious knowledge of both architect and craftsman regarding the relationship between the types of rocks used and their strength. Looking both to the appearance of the blocks and slabs and to the visible effects of the differentiated loads, it is also obvious that not only the weights of the blocks and slabs were taken into account, but also the settling forces they were to induce, depending on their position in the built structure. These skills allowed the masonry to survive in good condition, while the limestones cut for the blocks and slabs kept their natural characteristics almost unchanged, without giving way, even in the presence of disturbing factors.

Figure 137. Trench S1, excavating the dismantled *dromos II*: a) remains of the foundation ditch for the northern wall, view towards east; b) general view towards west of the current entrance (1 – concrete foundation for the door; 2 – dressed block, northern wall; 3 – Late Roman walking level in the middle of the former corridor; 4 – parts of plinths).

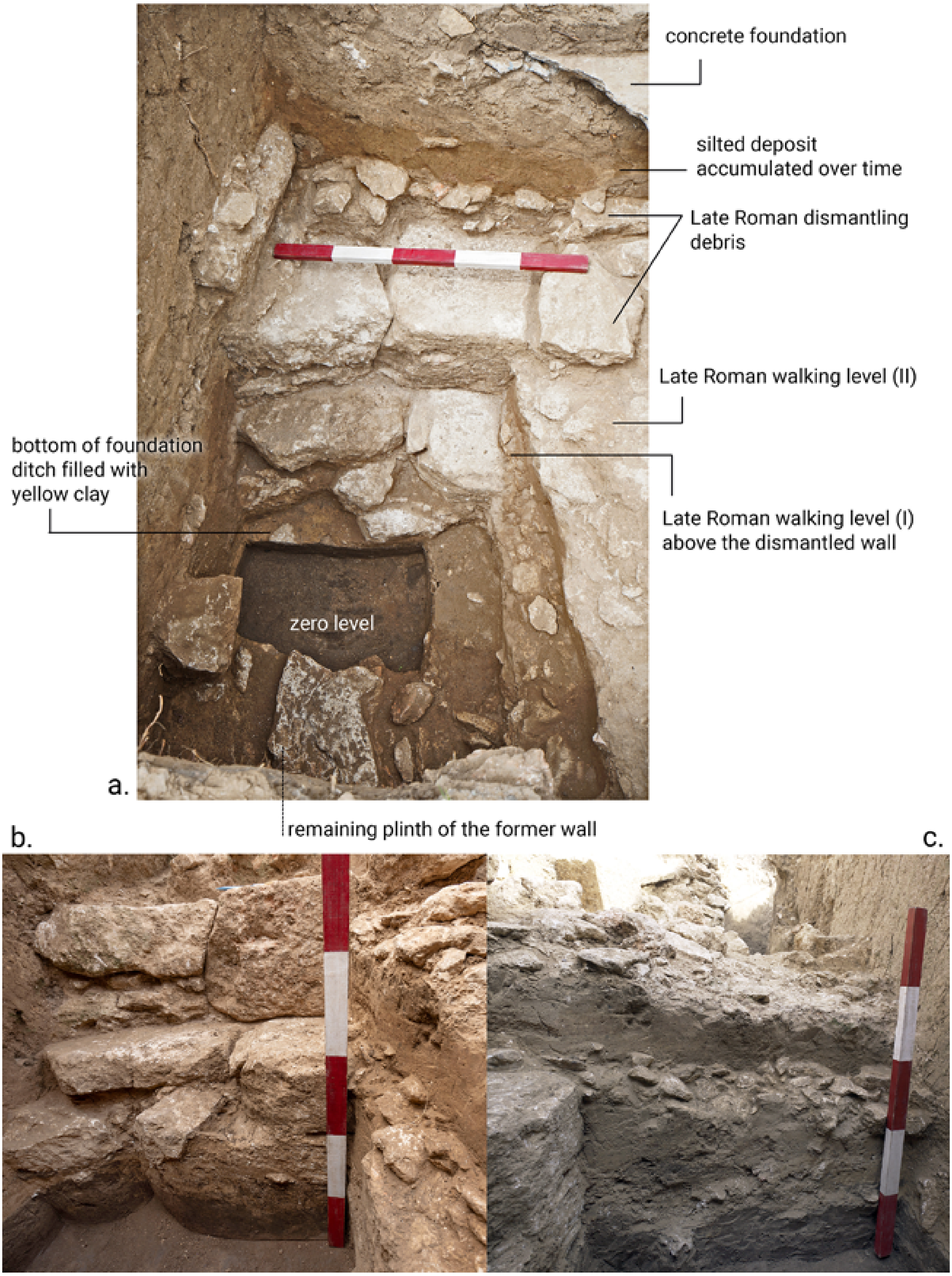


Figure 138. S1: a-b) southern wall of dromos II, dismantled, views towards west; c) two overlapped layers of stone chips (Late Roman walking/dismantling levels) seen towards north; the lower one overlaps parts of the dressed stone of the southern wall, meaning that the wall was already partially dismantled.

Figure 139. S1: a) view towards north; b) detail with the interior side of northern wall; c) soil accumulated over the initial dismantling of the *dromos* floor, under a Late Roman chip stone layer (II) – marking a walking/dismantling level; 0 – construction level; 1 – secondary position, placed in the filling of SIV/1994.

Figure 140 S1: a, c) views to east with the fingerprint of the former *dromos* and secondary filling; b) southern *dromos* wall inserted in a shallow trench and its back filling withs stones; d) view towards SE.

b.

a.

Figure 141. Dismantled *dromos II* in S1, with supporting adjacent rubble walls: a) southern wall and Z5; b) northern wall and Z6.

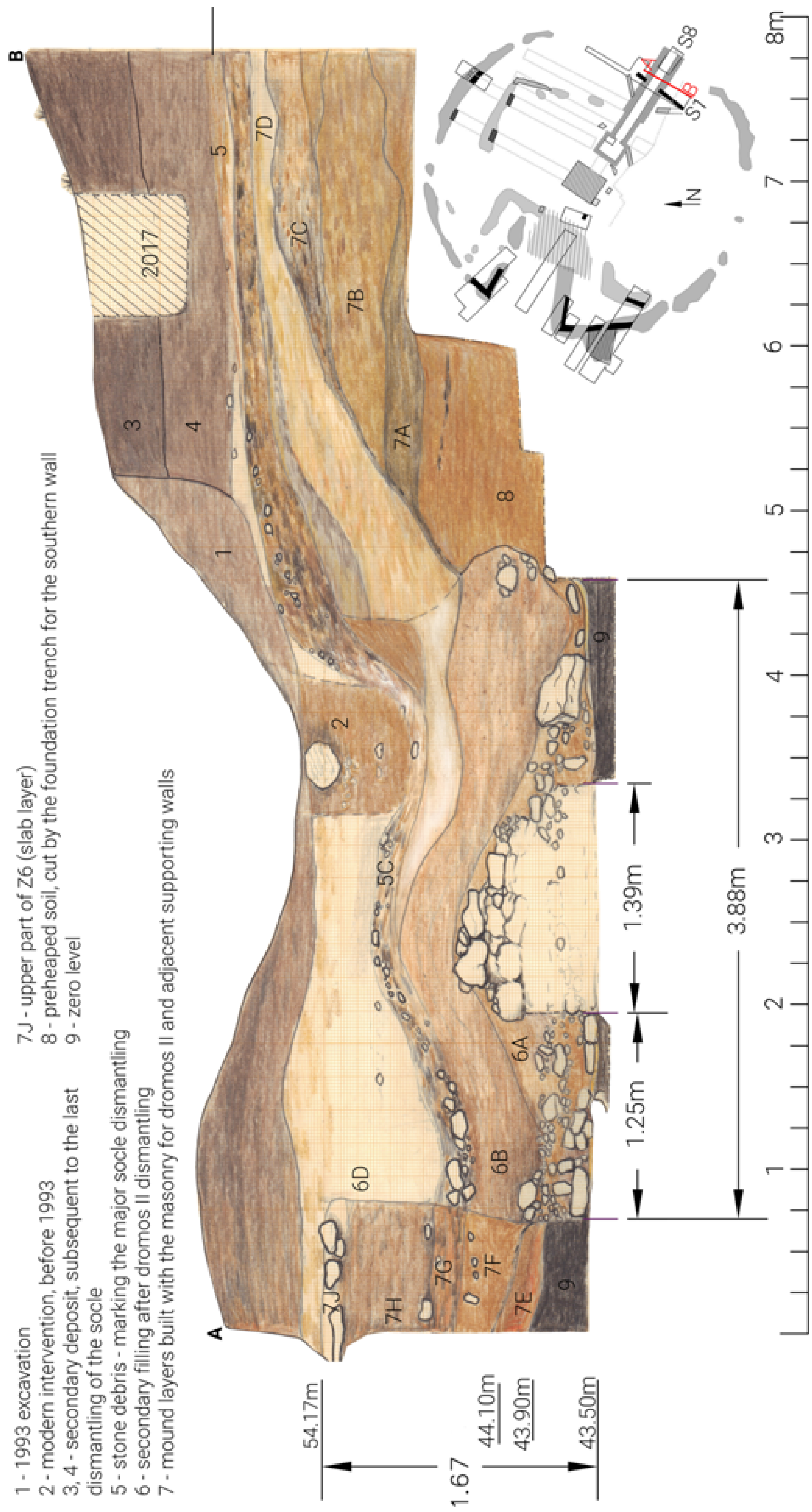
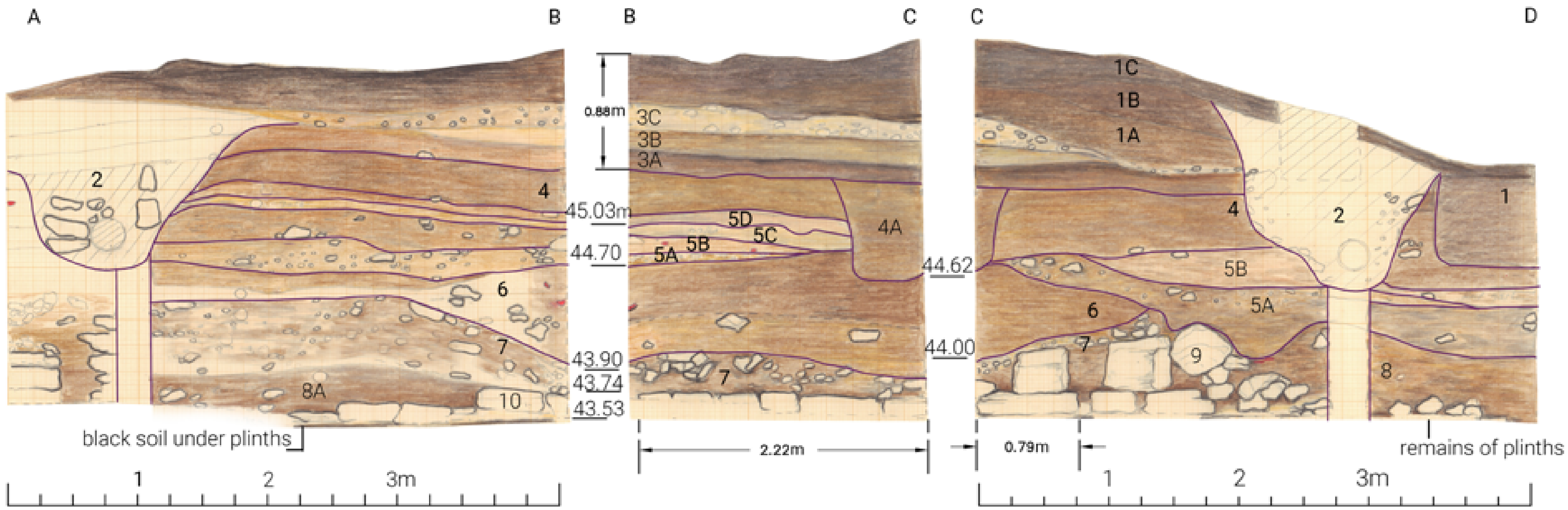


Figure 142. Stratigraphy in trench S1, eastern side.



1 - excavation 1993; 1A-C - soil deposited during 1993-1995; 2 - trench for a plastic water pipe connected with the military unit, filled with stones from the site area; 3 - construction layers for the military dyke;

4 - deposit accumulated in time, few materials (Late Roman), desertion; 4A - pit (Feature 7);

5 - occupation layers (5th-6th c. AD); 5C - yellow clay floor (feature 9) - surface structure associated with Feature 8 (post pit); 5A - latest dromos dismantling - many stone debris, including Hellenistic pottery;

6 - deposit accumulated in time;
7 - major dismantling, over the latest Late Roman period walking level (, stone fragments, including slabs; Hellenistic & Late Roman materials);
8 - homogenous filling over the southern wall dismantling, Hellenistic materials;
8A - homogenous filling over the northern wall dismantling corresponding with the deposit under the central stone agglomeration - Late Roman walking level;
8 - dressed blocks, secondary position;
10 - soft limestone slabs - pavement.

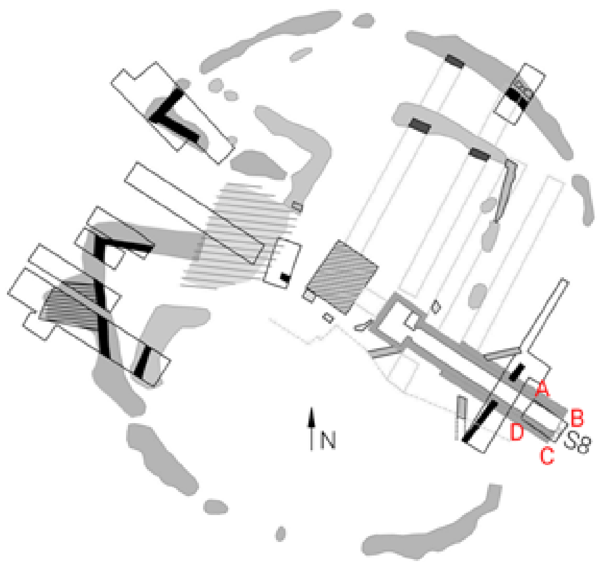


Figure 143. Trench S8, stratigraphy.

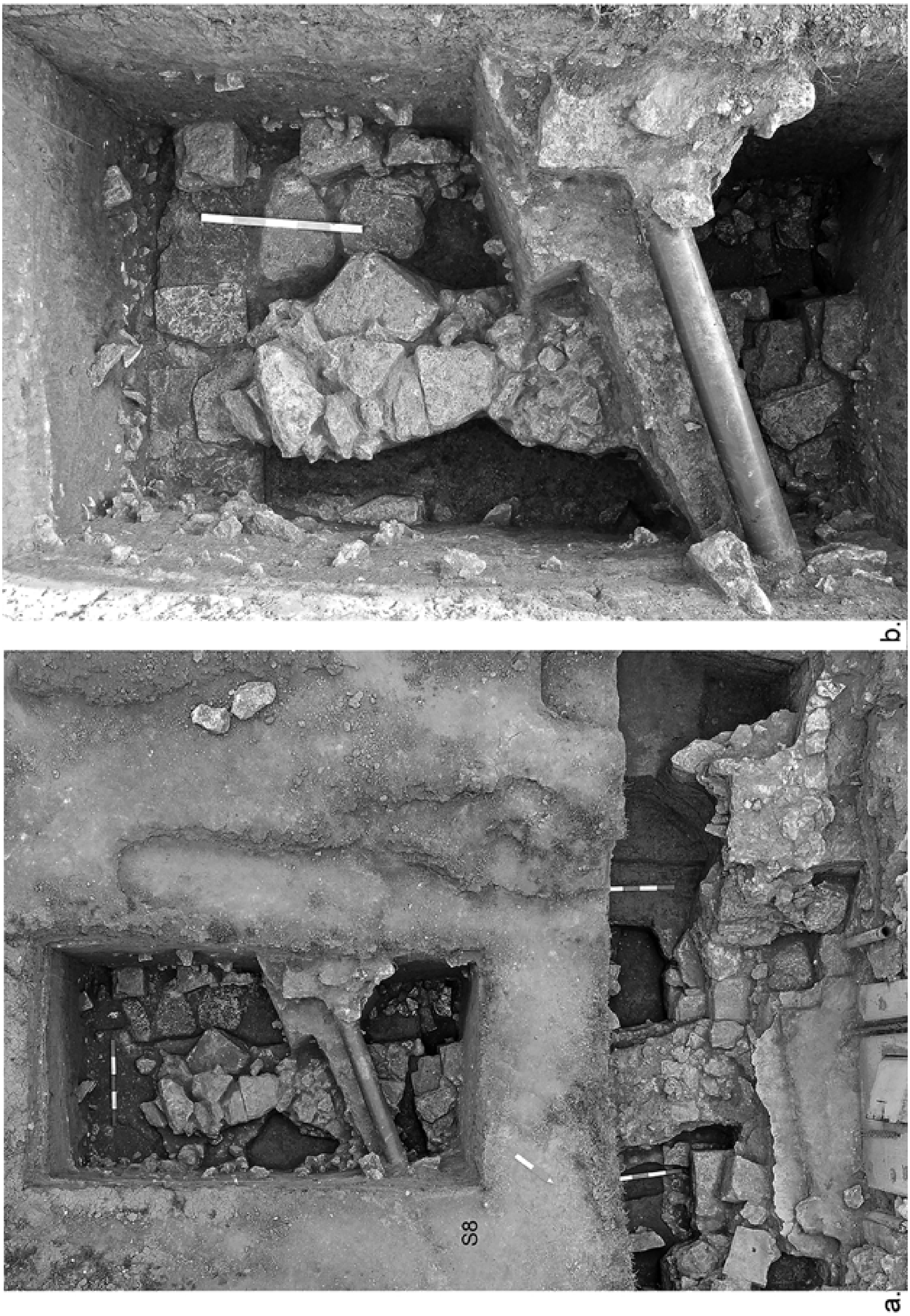


Figure 144. Aerial views of trench S8: a) connection with S1 and current concrete door; b) final excavation stage (May 2019).

Figure 145. Trench S8, excavations stages in the Late Roman period deposit containing the remains of the *dromos* dismantling (a: 45.00 m, b: 44.60 m, c: 44.00 m); A) post pit (feature 9); B) pit (feature 7); C) yellow clay floor for a surface structure (feature 8).

0 - construction level

1 - plinth for northern wall in ditch with yellow clay

2 - Late Roman level dismantled slabs

3 - floor in dromos II

4 - exterior pavement

5 - dismantled blocks southern wall

6 - stone debris, oblique covering the entrance

7 - plastic pype irrigation

a.

Figure 146. Trench S8, the remains of the dismantled entrance in the *dromos*.

Figure 147. Trench S8, foundation ditches for *dromos II* walls, slightly deepened in the construction level.

Figure 148. S8: a) entrance to *dromos II*; b) remains of the southern wall of *dromos II*; c) plinths for the dismantled northern wall reaching the pavement.

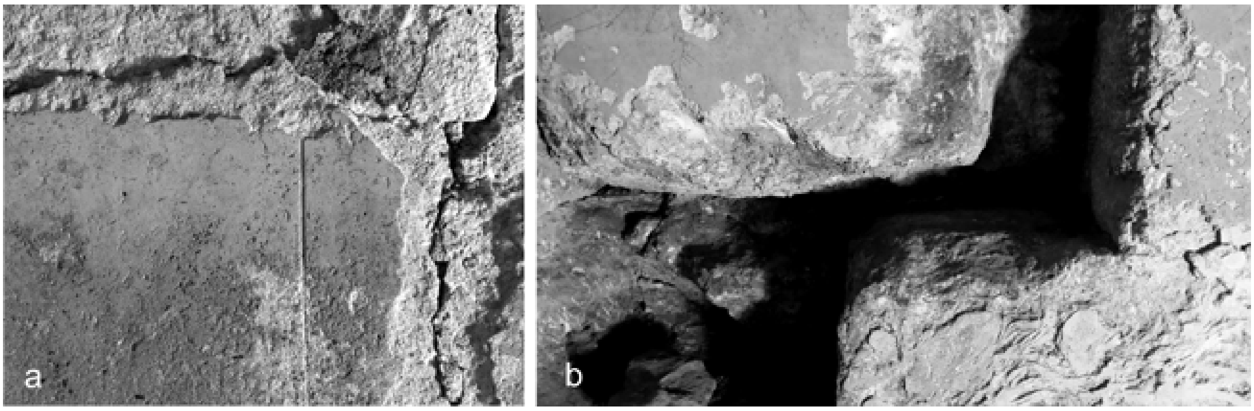


Figure 149. The limestone used for blocks in the funerary chamber had different porosity and petrographic characteristics.

Petrographic varieties of limestone used in the tomb's construction

Regarding the petrography of the limestone blocks, this was highlighted via binocular magnifying glass, observations made directly on samples of the masonry blocks, and analogies with other samples collected outside the burial chamber. The samples coming from the tomb were gathered from the floor during the initial cleaning stage in 2017, being dislocated fragments due to the degradation processes occurring after 1995, when research activities at the tomb ceased. The limestones from which the blocks and slabs were made have a generally compact appearance (Figure 149/a), but they are characterized by a variable porosity Figure 149/b). Thus, they were identified from slightly microporous limestone, to limestone in which the stratification of the original carbonate deposits marked by colour differences may be observed, respectively limestone formed by compaction and diagenetic cementation of shellfish residues (especially bivalves of small to large size) (Figure 149/b).

All these types were identified microscopically in the samples collected from structures built in the mound around the tomb. They were also similar to samples collected from the Limanu quarry area, confirming that they belonged to the Sarmatian deposits of the region. The observation areas inside were mainly those sections without plaster, or with fallen plaster (especially at the boundary between the rows), the wall plinths, the dismantled areas of several blocks, such as the niche in the northern wall of the burial chamber and the broken block at the top left of the east wall, which has a slightly lateral crack.

Four categories of limestone from those described microscopically on the surface and the Limanu quarry samples could be identified on some blocks, or following mesoscopic analysis of the fragments found by the team of archaeologists, noted below:

- CFc = compact fossiliferous limestone
- CL = lumachellic limestone/bio-calcarenites with bivalves
- CP = micritic or sparitic limestone (chemical precipitation origin), +/- slightly fossiliferous.
- CN = limestone with nubecularia and small gastropodes

In the funerary chamber, their positioning is as follows:

- CFc: - eastern wall: R07_B2; R06_B2, B3; R05_B3, R02_B2
  trench S9, sq. 2, -0,15 m - CFc with small cardia
  trench S9, sq. 2, -0.15 m under the top floor plinth surface
- CL: - east wall E_R05_B2
  southern wall S_R03_B3
  western wall W_R03_B2
  northern wall N_R03_B1, B2, N_R04_B2
  trench S9, sq. 2, -0.02-0.04 m under the top floor plinth surface
  trench S9, sq. 2, -0.15 m under the top floor plinth surface
- CP: - southern wall S_c06_B2
  western wall W_c04_B2
- CN: - trench S9, sq. 2, Feature 4, 0.45-0.65 m under the top floor plinth surface

The predominant limestone variety in *dromos* II which could be highlighted with certainty by macroscopic observation, and by analogy with the samples collected outside the tomb, were the whitish-white bio-calcarenites with bivalves (lumachelic limestone), without limonitizations. Considering the differences in shades and the apparent compactness and porosity of the stone, we also identified a variety of chemical precipitation limestone (micritic and/or sparitic texture), +/- slightly fossiliferous). For these, the presence of fossils is rare, being syngenetically trapped in the carbonate mass, not as a result of mechanical accumulations, as is the case for lumachelic limestones. They also have a superior compactness and a much more uniform structural-genetic aspect. It is probable that other limestone varieties were used, similar to those identified on the site and described in Chapter 10, but there were no suitable observation surfaces in the *dromos* area for such detailed analysis.

The positioning of the stone elements identified petrographically in the area of the *dromos* is:

CFc: - southern wall DI: S_R05_B4, B5 (Figure 127) CL: - south wall DII: S_R07_B5, B6 (Figure 130) north wall DI: N_R05_B4, N_R06_B3 (Figure 126)
south side gable roof DII: B3, B5, B7, B8
north side gable roof DII: B8

Some observations regarding stone-cutting tools and techniques used for building the tomb

Funerary chamber

The stone blocks, cut to size in the quarry, were finally dressed directly on the construction site with the use of splitting and carving tools, similar to those used for other contemporaneous funerary constructions, e.g. the *Caryatides Tomb* at Sveshtari (Stoyanov, Stoyanova 2012: 727, fig. 7). They have at least one face brought to a higher degree of finishing in terms of flatness and appearance, but also a good processing of the contact faces. This high degree of processing was observed both on the blocks without plaster (those behind the furniture – mainly on the western lower wall), and on those covered in a sequence of plaster layers (from courser to fine), but from which the stucco has partially fallen.

There are several blocks with these characteristics, but the clay material with which they are covered has resulted from water infiltrating between the blocks, following the faulty backfilling made after the excavations dated 1993, preventing petrographic identification from direct observation.

The blocks were placed without mortar. In the places where the plaster has fallen, the marks of preliminary processing are visible. They attest the use of hammers and chisels, characterized by different shapes to their tips or of the cutting areas. The marks are 1 cm - 3 cm apart, with other traces varying from 3 cm - 5 cm long, in random directions, but which rarely intersect. Above them are traces made by spike-type tools, with metal points varying in thickness from 5 mm to 0.5 mm -1 mm.

The latter are the finest, located up to 1.5 mm apart (Figure 150). Considering the groups of processing lines, in the final straightening phase, it is possible that a comb-shaped tool with metal teeth, and a cutting tip may have been used. The apparent relief of the surface of the blocks used in the burial chamber does not exceed 2 mm - 3 mm between recesses and ridges (rises) compared to the average of the respective surface, often confirming that the processing was done in successive stages until the desired appearance was attained.

The ashlars of the first row, particularly visible in the western wall, exhibit a rougher processing, similar to those in *dromos* II, as well as with the fragments of wall plinths.

Dromos

The *dromos* consists of two sections, distinguished by the particular characteristics of the constructive elements (the type of finishing of the blocks, the type of roof, the presence/absence of plaster). The blocks used in *dromos I* are similar to those in the burial chamber in terms of size, type of processing and degree of finishing, while those in *dromos* II are roughly finished blocks, with coarser tools used, probably the splitting stage being followed by sizing and removal of the surplus material with chisel hammers with a working surface of 40 mm^2 -100 mm.[2] Thus the distances between the tool traces are greater and the surface relief more pronounced (Figure 134/a, b), with the difference between the deepest and highest elevations of the block varying between 5 mm - 35 mm. However, the general flat shape is obvious and a uniform and unitary appearance is present.

The blocks in *dromos I* have average thicknesses of 70 cm - 80 cm less than those in *dromos* II, with maximum lengths reaching 130 cm.

Specific to the blocks used in *dromos* II is the bevelling of the lower edges, the width of the bevel being up to 30 mm - 38 mm, at an angle of 20° - 35° to the horizontal (Figure 134/d), which also became a reference for the faces to join other blocks. For the vast majority of the blocks on the southern wall of *dromos* II, the bevelling was done also on the lower side of the exposed face and partially on the lateral ones.

The stone masonry elements were made of the same varieties of limestone found in the burial chamber or in the exterior wall/*krepis*, but processed according to the requirements of the particular type of structure. The blocks were made both perpendicular and parallel to the stratification of the limestones, easily observable in the superposition of the lumachellic levels, with an obvious preferential orientation of the bivalve shells, over which sometimes sparitic areas overlap (recrystallization of carbonates dissolved in solutions).

Alterations and degradations supported by stone elements

Dissolutions, calcitizations, limonitizations

Regarding the manifestation of secondary processes of rock alteration, the key observation regarding the

Figure 150. Details of the fine stone carving applied to the interior of the funerary chamber walls.

blocks in the funerary chamber is the very careful selection of the rock from which they were made. Unlike the blocks of the exterior structure, i.e. the monument base and the elements of the supporting masonry (reinforcement walls), they were made of limestone with the lowest porosity, the most compact, and with the superior visual appearance. Thus, although many blocks are made of lumachellic limestone (usually less resistant), their compactness is very high. No limestones with limonite, or secondary calcite deposits resulting from dissolving followed by recrystallization, or in the form of crusts, have been identified, which once again indicates the application of rigorous criteria for the selection of the construction elements of these buried structures.

However, deposits of carbonate material with the appearance of lime milk are observed on some blocks, but obviously this is due to the presence of plaster or the processes of dissolution of its components under the effect of post-construction infiltrations (Figure 152/a). Also, due to the change in the consistency of the embankment along the historical stages, there were leaks of clay material between the joints of the blocks, which brought reddish-yellow iron to the interior, in colloidal solutions and hydroxylated minerals, but also biotic remains (e.g. roots of straw plants), leaving traces on the plaster.

Masonry movements

Following the visual observations made in the funerary chamber and *dromoi*, several types of changes in the positioning of the masonry elements were found, as a direct or indirect result of the physical forces over the millennia (weight of the structure and/or mantle, earthquakes), or interventions made during the initial excavation of the site.

In the burial chamber the movement of the blocks from the southern area of the vault is still observed (Figure 103), but also on the southern wall in the south-eastern corner, which determined the formation of spaces of 30 mm - 80 mm between the blocks. In the western wall, blocks B2 and B3 of the fourth row are slightly further apart, and in the central part of rows 06 and 07 they have deviated millimetrically from the initial vertical. Slight alignment changes can also be seen in the northern part of the sixth row on the east wall, in the area where the additional pressure induced by the curvature of the structure for the formation of the semicircular vault acted (Figure 157/a).

In the area of *dromos I*, the rows 04, 05 and 06 on the northern wall are no longer perfectly aligned to the vertical. The fourth and sixth rows have moved south by *c.* 20 mm, while block B2 of row 04 is broken (Figure 126).

The last two rows, 06 and 07, at the top of *dromos* II (up to the V-shaped ceiling) slope slightly outwards (Figure 134/c-d), the effect of pressure from the weight of the stone slabs, superimposed over the plasticity of the clay levels in the mantle, which could not stop this gravitational slip. The deviation from the vertical is 7° -10°, the process being observable on the northern side, but at an angle a few degrees lower. At the northern wall, the movement of rows 06 and 07 from the horizontal can also be seen, leaning 3° - 5° to the north, an observation facilitated by the presence of the niche that constituted the former entrance.

They are more coarsely finished blocks, made from cruder tools, so the distances between the tool traces are greater and the surface relief more pronounced (Figure 134/c), with the difference between the deepest and highest elevations varying between 5 mm - 30 mm.

Cracking, exfoliation and loss of material under compaction forces

The clearest evidence of the manifestation of differentiated compaction forces is found on the eastern wall of the burial chamber, above the entrance. The semicircular shape of the vault was obtained by convexly processing the upper face of the blocks at the boundary of the wall with the vault blocks, by the angular processing of the voussoirs, fixed mainly by their own weight and the friction between adjacent surfaces at equilibrium, additionally reinforced with lead clamps. Thus, the weight of the blocks was positioned partly on the semicircular structure and partly on the eastern and western walls, but it was also supplemented by the manifested divergent forces. To the weight of the blocks was added that of the clay material that constituted the mantle, significant enough at the determined thickness (over 3.5 m above the grave).

The fact that the eastern wall of the burial chamber was not full (due to the access space towards the *dromos*) resulted in a lower load-bearing capacity compared to the western wall. Thus the blocks above the portal have withstood the biggest bending force, and some of them have given way, by axial cracking (E_R10_B1), Y-shaped cracking (E_R07_B1, E_R05_B1, B2), either along a single plane (E_R07_B3) or by multiple fracturing (E_R03_B1).

In the cases where the blocks had slightly lower compactness areas, the material simply detached (E_R07_B1), exfoliated from pressure from the outside to the inside of the block by 1 mm distance, or the corners of the blocks in the contact area were ground down and the material fell. Obviously, these are visible processes where the blocks are no longer covered with plaster, in fact, the layer of mortar with plaster being the most significant example of loss of adhesion to the lithic substrate. The place and shape of the cracks on the remaining plaster faithfully follow the joints between the limestone blocks and the yielding areas of the stone under the manifested bending forces. This process took place gradually over the centuries, due to subsidence and moisture induced by leaks of aqueous solutions between stone blocks from the vault, with clay material and colloidal ferruginous minerals, additional to the free access of water through the doors, when the burial structure was inhabited or looted. Thus, the visible traces at the bottom of all walls of the funerary room and *dromos* are evidence of water stagnation over long periods of time (Figure 114).

On some blocks without plaster, the slight lineage given by the lumachellic levels from the rock formation period is observed, these being mostly quasi-parallel with the long sides of the blocks (parallel to the stratification). This preferential aspect of sizing determines a better resistance to bending, but also the superior preservation of physical integrity. In the *dromos* there are a few areas where the rock appears ground down or physically degraded, such as the area of the niche on the northern wall, but this corresponds to the position of the initial access door, which meant subsequent intervention after construction.

Chapter 9
Plasters and Pigments

The painted decoration of the Documaci tomb against the background of wider early Hellenistic funerary artistic trends

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The interior wall faces of the funerary chamber in the Documaci tomb (Figures 91-92) were decorated in the so-called 'Masonry Style'[1] (Bruno 1969: 308; Brecoulaki 2016a: 679-683; 2016b), an imitation in plaster and paint of regular ashlar masonry, spread widely and beginning with the 4th c. BC in the Hellenistic *koiné*, for domestic[2] and funerary mural decoration. The style is commonly characterized by the division of wall ornamentation in horizontal registers, sometimes additionally separated in panels, alternating with friezes and orthostates, depicted so as to resemble various lapidary textures, e.g. glossy marble, colourful veined or mottled stones. Several preferential schemas can be identified (Andreou 1989). It was frequently accompanied in the decorative overall design by an illusionist approach to architecture, in which a sense of three-dimensionality was added by the use of painted shadows, or modelling low-relief elements in stucco. The regularity of masonry (in dimensioning and assembly) was ensured by incising the wet plaster to suggest straight and delicate joints, with finely bevelled margins, and, sometimes, even with relief corniches and mouldings. The uniformity of stone textures and hairline joins represented the height of aesthetic ambitions for Greek stone architecture for the entire Classical era (Martin 1965: 356-409; Hellmann 2002: 110-118). Plasterwork and paint helped mimic the beauty of all varieties of luxurious decorative stones, at considerably lower costs. These techniques required, however, the employment of highly trained craftsmen.

The appeal of painted plaster for funerary designs in general,[3] sometimes just as monochrome stucco, became well established by the end of the 4th c. BC, including in Crimea (Rostovtzeff 1919) and Thrace (Valeva 2018), where, for example, the building of tombs with fired bricks in the region of Kazanlak was explained as an innovation that emerged because the material was more suitable as a surface to exhibit plasterwork decoration (Gerding 2006). What can we see, especially in Thrace, where stone architectural decoration remains nevertheless prevalent, is often just a provincial imitation of the 'Masonry Style' used in ancient Macedonia, like the practice of alternating coloured horizontal registers, but without the plaster incisions for ashlars joints.[4]

'Masonry style' applied in tombs is quite similar to the models used for domestic decoration, bringing thus even closer the concept of the chamber tomb to that of a house. The *klinai*, doors, and tables found in tombs allude, after all, to the same domestic spaces. In the richest tombs, this style was complemented by complex friezes involving groups of characters or vegetal motifs, for which a larger palette of colours was employed, exhibited especially on tomb facades. The illusionist style meant that occasionally tombs were painted with total replacements of funerary paraphernalia (decorative ribbons, wreaths or weapons hanging on nails painted on the walls),[5] or other architectural elements (windows, doors, half-columns).[6]

Despite the similarities in the articulation of wall decoration and the techniques employed, each tomb constituted in the end a unique piece of art. Over 150 years of painting and plastering, no two tombs were found completely identical.

At Documaci, the funerary chamber and *dromos I* were covered, as the various optical and physical chemical analyses showed (see further the following chapter sections for details) with two layers of plaster of different coarseness made of lime and marine sand as aggregate, followed by a third, the last and thinnest one, of paint – obtained also on a base of lime solution in which pigments were mixed. The analyses revealed they came from organic (carbon for blue-black) and mineral compounds of local origin: calcium carbonate for white, earth ochres for red and yellow. It is clear that the floor

[1] J. Valeva (1999) refers to it as *style à zones*, and S. Miller (1993: 93-98) as the 'painted architectural style'. This method of decoration appeared, probably in Greek houses, sometime during the end of the 5th c. BC (Walter-Karydi 1998: 33), adopting decorative schemes and aesthetic ideals that had already been applied in the design of temples and other public buildings of the Classical period

[2] The houses in Pella (late 4th-3rd c. BC; Lilimpaki-Akamati *et al.* 2011: 112), Olynthos (since before the mid 4th c. BC), later (2nd c. BC) in Delos (Bezerra de Meneses 1970) and Amphipolis (Ginouvès, Akamatis 1994: 103, fig. 92-93).

[3] Earlier use of painted stucco for monumental cists at Aiane in the 5th c. BC (Karamitrou-Mentesidi 2008).

[4] Kazanlak (Valeva 2018: 339, with bibliography; Moritz 2007: 108-111).

[5] Macedonian tombs Lefkadia – 'The Tomb of Lyson and Kalikles', Aegina Meristos, Eretria – 'The Toumba Tomb', cist grave at Tragilos (Miller 1993: especially plates 1/f, 7/fa, c, 8/c, 9).

[6] 'The Eurydice Tomb' at Vergina (Drougou, Saatsoglou-Paliadeli 2008: 60, fig. 83; Andronikos 1987).

of the funerary chamber was also plastered, as well as the interior face of the threshold block. The colour was applied *al secco*, i.e. after the previous layer had dried. This technique has a wide application in Macedonian tombs (Palagia 2016: 480). Aside from the pigments, in the last applied layer, fragments of crushed marble were added to enhance the lustre.[7] Pliny (*Natural History* 36.55-44) describes the need to add crushed marble to wall plaster to ensure the brilliance of the top surface. He also explained the need to have multiple layers of plaster (for brilliance and resistance), or the need to add sand to the lime if the atmosphere were damp (for example near the sea). If marine sand was used, one third of lime was to be added.

Decoration schema

With the exception of the areas hidden under the furniture, the funerary chamber walls displayed a unique decoration schema (Figure 151) composed of five horizontal registers mimicking pseudo-isodomic masonry, using blue-black, white and red as the main colours, with yellow added just for details. The organisation and dimensions of these registers can be related with enough certitude to a generally previously projected design, in which ancient measuring length units can be recognized and also a certain interplay between ratios and dimensions. Minute differences in the actual implementation of the projected design, corroborated by alterations over time affecting the plaster and walls, should nevertheless be taken into consideration as a cause for variations, meaning that some smaller ancient measuring units might need to be taken into consideration.

The registers from the floor up:

1. A plain socle (*toichobate*) without marked vertical joints, coloured in white, measuring 0.318 m - 0.320 m in height above the plastered floor and 0.332 m - 0.340 m above the bare wall plinths (close to an Hellenistic foot high, proving that the plastering of the walls and the calculation of the decorative registers were made before the plaster for the floor was added); a thin blue line (made in one brush stroke) was observed at the base of the *toichobate* on the southern wall, marking the joint with the plastered floor.

2-5. The main wall area divided into four horizontal successive registers (two higher dark blue-grey rows of rectangular panels (2, 4), orthostates, intercalated with two friezes (3, 5). Each of the four is a different height.

2. one row of rectangular panels with fine faux joints on all four sides incised in wet-plaster; dark blue-grey colour; very close to 50 cm high (1.5 feet), very close to 0.75 m long (2.25 feet) if entire; 0.37 m if halves; does not appear on the western wall were the corresponding space was occupied by the *klinai*. On the eastern wall, because of the entrance, and for a symmetrical link to the friezes, there is no vertical division after the first joint.
3. One frieze of rectangular plates, laid horizontally, delimited by incisions in plaster all around; dark blue-grey, alternating with dark red, both additionally decorated with yellow and white vermilions and three oblique pairs of free-hand painted lines each (or two for the short-length plates), imitating marble or perhaps another type of decorative mottled stone. Poorly preserved. This frieze is on all the walls with the exception of the western one, where, at that height, the corresponding space was occupied by the *klinai*. The position of this frieze relates to the volumetry and decorative elements of the beds; very close to 0.22 m high (= 10.5 *dactyls?*); close to 0.75 m long (2.25 feet) if entire. The shorter plates measure half this length on the southern and northern walls, fitting nicely with the beds (thus, on the southern wall, where Bed 1 has its short side, two entire plates fit, and one half plate, while on the northern wall, where Bed 2 has its long side, the remaining space allowed an entire plate. Nevertheless this was divided into two and painted alternatively, enhancing the symmetry. The eastern wall would have taken four entire plates and most (80%) of a fifth (1.8 feet). The joints for the plates were drawn accordingly, even though the space was interrupted by the entrance.
4. One row of rectangular panels with fine *faux* joints on all four sides incised in wet-plaster, with the exception of the panels above the *klinai* which do not have the lower joint; dark blue-grey colour; close to 0.75 m long if entire; 0.37 cm if in half. On the western wall the space of 10.8 feet was divided, having the upper frieze as the dominating element, for which the vertical joints of the fourth register represent centers. The arrangement nicely fits the width of Bed 2 to the largest panel, measuring 0.94 m long. The heights seem to vary: 0.47 m above Bed 1, 0.45 m above Bed 2, and 0.46 m on the eastern wall.
5. One frieze of rectangular plates, laid horizontally, delimited all around by incisions in plaster; dark blue-grey, alternating with dark red, both additionally decorated with yellow and white vermilions and three oblique pairs of somewhat parallel lines each; *faux* marble or perhaps

[7] Similarly in the houses at Delos of the late 2nd c. BC (Kakoulli 2009). Pliny (*Natural History* 36.54/5).

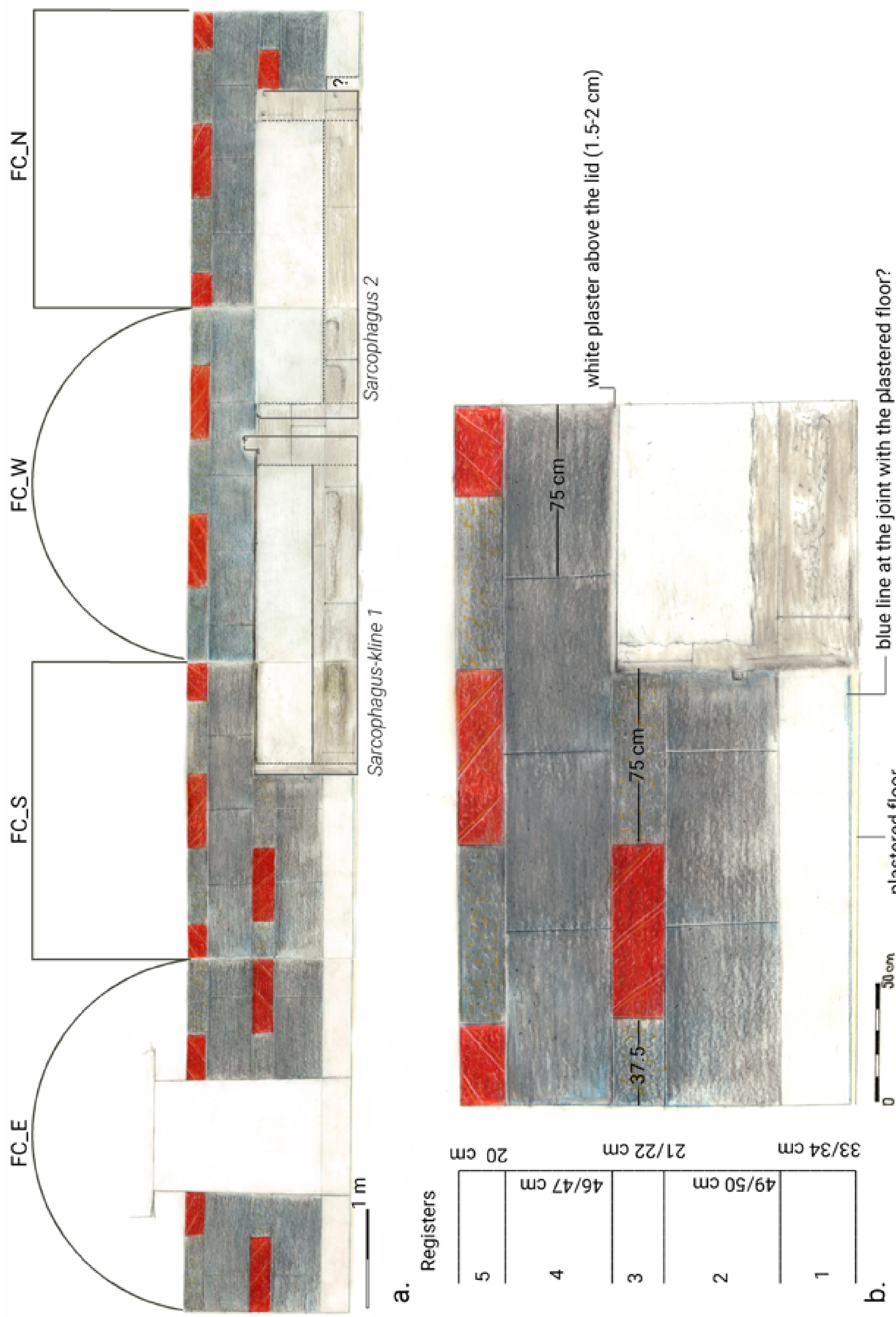

Figure 151. Reconstruction of the painted decoration schema and *kline*-sarcophagi in the funerary chamber (after drawings by Fl. Marțiș).

another type of decorative mottled stone; close to 0.20 m high; close to 0.75 m long; the frieze edges were modelled in low relief in plaster (1 cm high); only the red details are halved in this frieze, in contrast to the lower frieze where only the blue ones are halved.

6. The rest of the remaining upper parts of the walls, including the vault, were painted plain white.

The height of the coloured horizontal registers, together with the socle (1 + 2 + 3 + 4 + 5), measures an average of 5.2 feet (1.7264 m) from the stone plinth up.[8] At this height, the upper edge of the highest frieze, which is modelled in low-relief, extends by 2 cm the true height of the stone wall underneath. The largest difference is in the south-west corner (1.755 m), due perhaps to the level of the plinth. Also the groove for the lid of Sarcophagus 1 is lower in this corner by 2 cm. The panels and friezes painted and delimited in plaster mimic an ashlar wall arranged in *pseudo-isodomum* style, with the vertical false joints of the high blue panels extending one from the other, exactly at the centre of the *faux* marble plates in the friezes. The friezes alternatively juxtapose colours. The mural decoration is therefore characterized by symmetry, regularity, and a certain austerity. It is obvious that a unique measurement module was applied both in the general architectural design of the funerary space and in the masonry-style plastered decoration, i.e. the Hellenistic foot of 0.332 m. This is also an indirect argument for considering the plastered and painted decoration as part of the original funerary design. The threshold was part of this initial model, as it continued practically the white socle of the walls along the entrance opening, being plastered, and probably painted in white on its interior face. The *faux* joints incised in the plaster, measuring 2-4 mm wide, did not correspond with the joints of the limestone blocks underneath. This proves that the cutting of the stones was done to fit the planned building project, meaning that the length of the blocks did not matter necessarily, only their heights, which generally correspond with the measurement unit of a foot. A few plaster joints were not perfectly straight, having a deviation between the ends of a maximum of 1 cm.

The walls of *dromos I* were completely covered in plaster and white paint, without *faux* joints. Several areas of the southern wall still preserve an impressive lustre, suggesting that after the paint had dried the wall surface was polished to give the appearance of marble, or even alabaster.

These features support the interpretation of the painting decoration of the Documaci tomb as having involved highly trained specialists, not imitators, most probably of Macedonian origin.

Sequence of work

Several particularities of the plastered surfaces allow us to understand the work sequence. The walls were plastered only after the stone slabs for the floor, the threshold block, and the rough stone framework of the two *klinai* were set in their designated places.

As already mentioned,[9] the *klinai*-cists most probably had their exterior and interior surfaces prepared with mortar as well, acting as an adhesive for the marble plating. The identified fragments of the decorative marble plates had traces of mortar on their reverse sides (in addition to iron clamps), suggesting that they were fixed on more massive stone blocks that were plastered, and that the binding was done when the plaster was still wet. A layer of courser plaster, unpainted, was found immediately under the level of the *klinai* lids, on the chamber walls, but above the level of the *klinai* bases (left completely unplastered). The bases were very probably solid, with the deceased deposited between the stone base and the marble lid (Figures 112; 114). This empty space for the body was plastered. This is a supplementary argument for the possibility that the walls were plastered after the stones for the *klinai* basis were installed, at the same time as the courser plastering of the furniture.

It is very probable that the first mortar layer on the walls and *klinai* corresponded also with the rough plaster covering of the floor slabs, as a possible *faux* horizontal joint, carved in wet plaster (which was most probably the second layer of plaster, and finer), seems to separate the southern wall from the plastered surface of the floor. As the plasterwork has not been washed (purposely, until conservation begins), it is not yet clear if this border was additionally enhanced with a blue line. Also, the joint made by the wall with the plastered floor in the corners is rounded, smoothed, so their finishing must had happened as interconnected operations.

After the second layer of plaster was brushed on the walls, the lines for the false joints were imprinted in the wet material. After the second plaster layer had dried, the paint was applied. The white area of the socle was painted before the blue, as centimetric blue drops can still be noticed on the white socle and on the remaining plastered floor slabs, at the bases of the southern and eastern walls. It is not yet clear if the white was applied

[8] An exception seems to be the south-west corner, above Bed 1, where the coloured wall measures 1.75 m. Was this deviation caused by the difficulty of working an already made bed, or was it an attempt to correlate the resulting height of the bed, after *in situ* finishing, with the golden ratio?

[9] see Chapter 8. The Tomb: Funerary furniture

uniformly all over the tomb before anything else, as we are inclined to think, or only on the designated surfaces.

In the areas painted blue, the coloured limestone solution was applied uniformly over the entire surface, including the future friezes. After the blue paint had dried, red was added over it. We can still observe the blue layer under the red in the areas where the red has fallen off, and also some red droplets on top of the blue panels underneath (Figure 153). It is possible that after all the paint had dried, some wall polishing was done with abrasive materials, specifically on the white areas, to increase surface shine. The technique of painting on top of a preliminary undercoating made of another colour is attested in the early 3rd c. BC 'Tomb of the Palmettes' in Lefkadia (Palagia 2016: 481), also in the 'Tomb of Ag. Athanasios', near Thessaloniki, dated around 300 BC, here in a blend of *al fresco* and *al secco* techniques (Brecoulaki 2006b).

The colours

The reduced colour palette applied at Documaci discloses artistic familiarity with a certain aesthetic appreciated in the Classical period Hellenic *koiné*. White-red-yellow-black was the traditional four-colour schema presented by Pliny in his *Natural History* (35, 32) of the 1st c. AD, as preferred by the greatest Greek painters of the Classical times, such as Apelles (born *c.* 370 BC and working *c.* 320 BC). The reduced palette, known as *tetrachromy* or *quattuor colores* (Brecoulaki 2006a) was an attempt to relate to the pre-Socratic ideals of the four basic colours of the elements (Bruno 1977), or to the Hippocratic doctrine of the four humours (Gage 1993: 29-30). The lack of blue in this ancient formula may be explained by the fact that black pigments could be used to obtain blue, which is exactly the case at Documaci, where the dark blue-grey shades were obtained by mixing a certain quantity of carbon with limestone. Blue and black are thus here interchangeable. This combination of colours was extensively used in alternate registers in the decoration of tombs in Macedonia and Thrace, starting from the late 4th[10] through to the 3rd c. BC.

In the early single chamber tomb at Olynthos (Robinson 1942: 117-124, Pl. LIII-LVIII), on the Chalkidiki peninsula, dating from before the middle of the 4th c. BC, the interior walls were decorated in a similar fashion to Documaci, not *al fresco*, with painted stucco arranged in five alternating horizontal bands of colour (blue-black, white, red, white), divided horizontally and vertically by lines incised in the plaster, mimicking masonry. The narrowest band imitated alternating panels of red and white marble. The floor was also plastered. The tomb at Olynthos was looted in antiquity and its roof was missing: the excavator assumed the roof was a flat, made of wooden planks with a wooden gable for the facade; Mangoldt, however, proposes a gabble roof of stone slabs (2012: 58-59).

Consistent analogies for Documaci can be observed in the tomb Heuzey found at Korinos, Pydna (Heuzey, Daumet 1877: 227-234; Stampouloglou *et al.* 2019), not only a good 'masonry-style' example of plaster decoration, but a Macedonian-type tomb that included also two *kline* in 'Γ' arrangement and a long, barrel-vaulted *dromos*. The interior walls were covered with mortar and painted; the *dromos* included a frieze of *faux* marble plates, as at Documaci. The vault was painted white, with marble imitation for the transition from the side wall to the arch, and black for the base. The tomb was dated to the end of the 4th - early 3rd c. BC.

A frieze of alternating rectangular plates (white and grey), marking the springing of the vault, was employed in the white-plastered funerary chamber of the Malathria tomb at Dion (Miller 1993: pl. 7d), from the second half of the 3rd c. BC. A black and red *kymation* crowned the frieze.

The funerary chamber of the 'Tomb of the Palmettes' at Mieza (Rhomiopoulou *et al.* 2010), dating to the first half of the 3rd c. BC, had a white *toichobate*, a blue-black *dado*, separated by a white relief corniche from red panels ending in a second relief corniche-band painted black, while the walls from the springing of the vault up were painted in light yellow.

Among the tombs in Thrace relevant for this analysis is the corbel-vaulted tomb of the Helvetia mound, in the area of Kazanlak, with its facade entrance and interior chamber walls covered in white plaster, grooved to imitate pseudo-isodomic ashlar masonry, with wide drafted margins (Stoyanov, Stoyanova 2016: 326-327; Valeva 2015: 182). The chronology of this tomb is not clear, however a date at the turn of the 4th/3rd c. BC seems probable. The arrangement of the blocks incised in plaster is close to Documaci, with two band friezes intercalated with wider panels. The white plaster seems to be a later phase, added above an earlier coloured schema. A sequence of plastering phases was also attested in the Thracian tomb at Alexandrovo (Stoyanova 2015: 169, 173), generally dated in the 3rd c. BC.

Mineralogical study of plasters and pigments

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The symbolism and techniques of decorating funerary monuments are essential characteristics of any

[10] Aghia Paraskevi, Dion II, Dion III, Nea Potideea, Pella IV, Korinos Heuzey, Bella II in Macedonia (Mangoldt 2012; Brecoulaki 2006b; 2016; Hugenot 2008, Miller 1993); Kazanlak, Alexandrovo, Symbola, Maglizh (Valeva 2018; Stoyanova 2015).

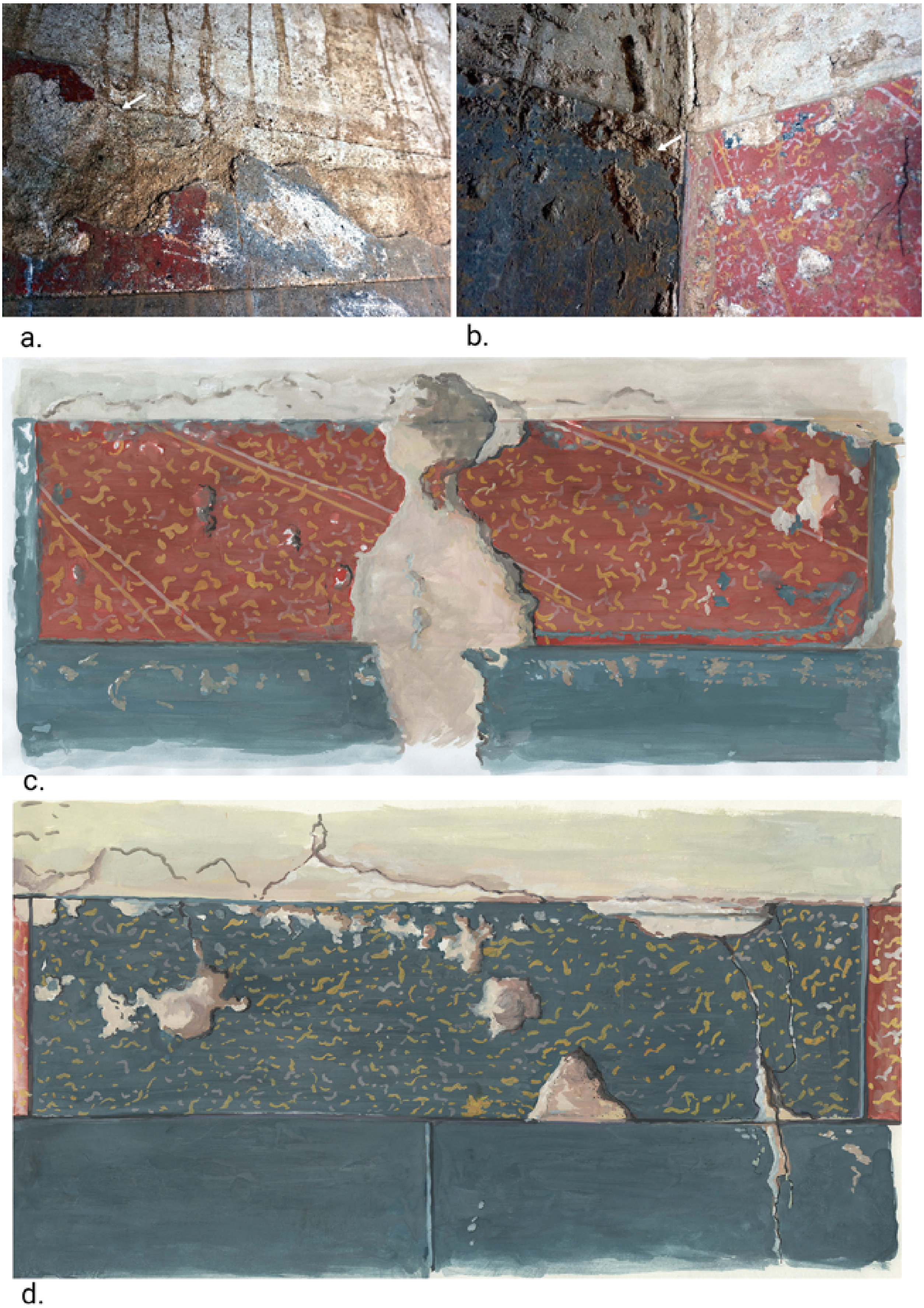


Figure 152. Painted plasterwork in the funerary chamber: a-b) differences between stone join (marked with arrow) and plaster join; c-d) details of the upper frieze (register 5) (acrylic painting by Fl. Marțiș).

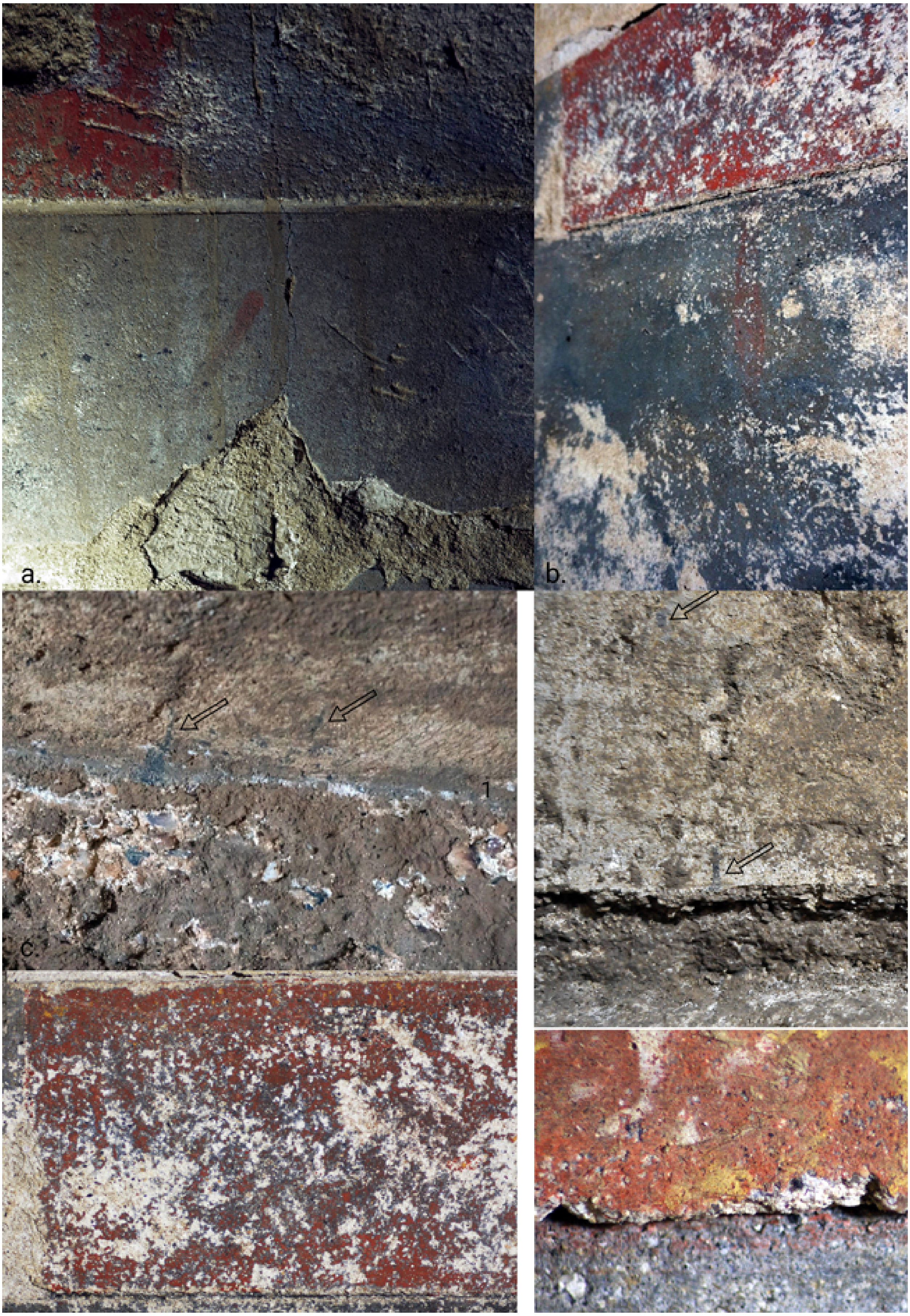


Figure 153. Funerary chamber, painted plasters, with details revealing order of colour application.

Table 12 Stratigraphic sequence in plasters from dromos of the Documaci tomb.

Sequence of layers in the plasters	Constituents
Layer 1, coarse-grained, 5-8 mm thick	*Binder* (45-55%): lime *Filler* (45-55%): beach sand (mainly mollusc shells, rarely quartz and feldspar grains; etc)
Layer 2, coarse-grained, 5-8 mm thick	*Binder* (45-55%): lime *Filler* (50%): beach sand (mainly mollusc shells, rarely quartz and feldspar grains; etc)
Layer 3, fine-grained, to 1 mm thick, white	*Binder* (85-90%): lime *Filler* (10-15%): calcite, quartz, etc.

archaeological culture. The barrel-vaulted tomb at Documaci is an example of early Hellenistic cultural influence in northern Thrace (Ștefan, Sîrbu 2016; Ștefan *et al.* 2017). As we have seen above, the funerary chamber and a segment of the *dromos* walls of the tomb are plastered and painted. The colour decoration of the murals in the tomb is arranged in successive relief belts with incised vertical lines separating red and dark-blue coloured panels (Figure 152). Directly on them, white and yellow decoration is applied using a stencil (Stefan, Sîrbu 2016). The decoration is elaborated in an illusionistic style typical of Early Hellenistic murals.

In the present work,[11] the plasters and wall painting of the funerary chamber and *dromos* of the Documaci tomb are studied to help us identify the materials used for the mortars and pigments, and their origins, as well as to clarify the techniques used for painting.

Material and methods

Series of samples of plaster extracted from different places of the *dromos* and chamber, and colour decoration fragments from the chamber, were studied in the Institute of Mineralogy and Crystallography of the Bulgarian Academy of Sciences.

The sequences of application of mortars and paints were studied in polished specimens and thin sections using a binocular stereomicroscope (Carl Zeiss Jena Technival 2) and a light polarized microscope (Leitz-Orthoplan) equipped with an Olympus C-5060 digital camera.

Chemical and phase composition of manually picked fragments of materials were studied using scanning electron microscopy (SEM) and electron probe microanalysis (EPMA) on a ZEISS SEM EVO 25LS equipped with an EDAX Trident system at 20 kV acceleration voltage. All specimens for SEM and EPMA investigations were preliminary carbon coated to prevent the surface charging. EPMA study included energy dispersive spectroscopy (EDS) element analyses at selected points (point analyses) and selected areas (area analyses) using an EDAX SDD Apollo 10 EDS detector and Genesis V. 6.2. software with ZAF correction method. Since the predominant part of the studied samples was composed of calcium carbonate (calcite), the content of CO_2 in them was determined by recalculation from the calcium content, and then the final analysis was normalized to 100%.

Spectroscopic characteristics of the studied materials were obtained using Fourier-transformed infra-red (FT-IR) spectroscopy and Raman spectroscopy. FT-IR spectra of plaster binder and limestone samples were collected at room temperature on a Bruker Tensor 37 spectrometer with 4 cm^{-1} resolution on standard KBr pallets in the spectral region 400-4000 cm^{-1}. Raman spectra of pigments were collected on a HORIBA Jobin Yvon Labram HR spectrometer equipped with an Olympus BH2 microscope using a backscattering geometry, a 633-nm line of He-Ne laser, an x50 objective, a grating of 600 g/mm, and a laser power on the surface of samples in the range 2-0.5 mW. It was found that under the laser irradiation the studied materials generate a very strong fluorescence signal. In combination with the Edge filter application needed to reject the Rayleigh line, this causes the Raman spectrum to have a ripple view (Figure 155/g). For this reason, the recorded Raman spectra were not baseline corrected and only narrow well-pronounced peaks were considered.

Results of the plaster study

Plasters are known to consist of binding materials such as lime, clay, gypsum, *inter alia*, to which sands and crushed building materials are added to increase the strength of the final material. The mineralogical investigations of the plaster include finding the

[11] This investigation was performed as part of a bilateral project, “Investigation of pigments and plasters from cult objects (IV-III BC) in the Dobruja region of Bulgaria and Romania”, between the Institute of Mineralogy and Crystallography, BAS, and the Romanian Academy, Institute of Archaeology.

Table 13 IR spectroscopy data for plaster binder: band's position, assignment and identified mineral phase.

IR peak	**Assignment**	**Mineral phase**
1080	symmetric stretching v_1 of CO_3	Calcite $CaCO_3$
1400-1440 875 713	asymmetric stretching v_3 of CO_3 out-of-plane bending v_2 of CO_3 in-plane bending v_4 of CO_3	
2520 1797	Combination modes $\nu_1+\nu_4$ or $2\nu_2$	
1450 855	asymmetric stretching v_3 of CO_3 out of plane v_2 of CO_3	Aragonite $CaCO_3$
2900-2800	C-H stretching in CH_2 and CH_3	Organic carbon
1170-1040	Si-O asymmetric stretching	Quartz
780-795	Si-O symmetric stretching	
460	Si-O bending	
3440	O-H stretching in water molecule	Water

proportions between the binding and filler materials, the chemical composition of the binding material, and mineral composition of the filler, and others.

Plasters from the dromos

The *dromos* plaster consists of three consecutively rendered layers: the first two (layers 1 and 2) are coarse grained with a thickness of 5 mm - 8 mm of each layer, and the third external layer is fine grained with a thickness of *c.* 1 mm (Figure 154/a-b, Table 12). Layers 1 and 2 are composed of almost equal volumes (45-55%) of lime binder and beach sand as filler. Pieces of semi-burned limestone occasionally occur in the binding material.

Chemical compositions of the binder in the three plaster layers are very similar and include mainly (in wt.%) $CaCO_3$ (90.2-94.6), SiO_2 (2.8-5.3), Al_2O_3 (0.8-1.7), MgO (0.2-0.7), Fe_2O_3 (0.4-0.8) and in minor amounts (<0.5) - Na_2O, P_2O_5, SO_3, MnO and Cl. The variation in lime compositions is due to variable contents of clay materials in the original limestones. The sand consists mainly of mollusc shells (90%), quartz (5-10%), feldspars (2-5%) and sporadic grains of magnetite, limestone, and epidote-chlorite-plagioclase aggregates.

The principal difference between the two first layers is the particle size of the filler, which is 3 m - 5 mm in the first layer and 0.5 mm - 1.0 mm, rarely to 3 mm, in the second layer. With the first plaster layer the ancient craftsmen smoothed the rough surface of the building limestone, using coarse-grained mortar.

Layer 3 represents a fine, lime plaster with small quantities of calcite and crushed marble additives. The layer also contains sporadic plagioclase, rutile, and quartz particles of 1-10 μm in size, derived from the original limestone used for lime production.

IR study of the binder material in layers 1 and 2 shows very similar spectroscopy characteristics (Figure 154/e). The most intensive peaks at 1440, 875 and 713 cm^{-1} in the IR spectra of binder correspond to the absorption bands of $(CO_3)^{2-}$ the carbonate group of calcites. Peaks in 1797 and 2520 cm^{-1} corresponding to combination modes are also common for calcite and aragonite. The group of peaks in the range 2875-2980 cm^{-1} probably indicates the presence of organic carbon. Positions and assignments of the IR peaks are presented in Table 13. The maximum of the main absorption band is shifted to higher wavenumbers compared to pure calcite, which may be due to the presence of aragonite of the mollusc shells.

Quartz (SiO_2) is common mineral in the studied materials. The 1080-1170 cm^{-1} absorption region related to Si-O stretching vibration is an indication of the presence of quartz. The presence of the mineral is also confirmed by the peak around 462 cm^{-1} (Si-O symmetrical bending vibration) and doublet at 780 and 795 cm^{-1} (Si-O symmetrical stretching).

Plaster from the funerary chamber

All the walls of the funerary chamber are rendered by plaster layer 1, while layer 2 covers locally layer 1, in the

Table 14 Stratigraphic sequence in plasters from the funerary chamber of the Documaci tomb.

Sequence of layers in the plasters	Constituents	Position in the chamber
Layer 1, coarse-grained, 5-7 mm thick	**Binder** (40%): lime **Filler** (60%): beach sand (mainly mollusc shells, rarely quartz and feldspar grains)	Covers all the walls
Layer 2, coarse-grained, 5-7 mm thick	**Binder** (50 %): lime **Filler** (50%): beach sand (mainly mollusc shells, quartz and feldspars) + calcite	Forms relief belt about 20 cm wide covering layer 1 nearly on the middle of the walls' height
Layer 3a, fine-grained, to 1 mm thick, white	**Binder** (85%): lime **Filler** (15%): calcite	Covers layer 1 in the upper part of the chamber
Layer 3b, fine-grained to 1 mm thick, dark blue	**Binder** (75%): lime **Filler** (25%): calcite + charcoal (as pigment)	Covers layer 2 of the relief belt and layer 1 on the lower part of the chamber

form of a relief belt *c.* 20 cm wide nearly in the middle part of the wall (Figure 154/c-d; Table 14). Layers 1 and 2 have nearly the same thickness, c. 5 mm - 7 mm. In the upper part of the walls, just above the relief belt, layer 1 is directly covered by white fine-grained layer 3a, up to 1 mm thick. In the lower part of the chamber, layer 1 and layer 2 of the relief belt are covered by the dark-blue, fine-grained layer 3b (Figure 152).

Plaster layers 1 and 2 consist of lime binding material, being *c.* 40% of layer 1 and to 50% of layer 2, and of beach sand filler. Pieces of semi-burned limestone are also found in the binder (Figure 154/d).

The particle size of the plaster filler of layers 1 and 2 is *c.* 0.5 mm - 1.0 mm, rarely up to 3 mm. In layer 1, beach sands are used as filler, while in layer 2, crushed calcites are added to the beach sands (up to 33% of filler) (Figure 154/c-d). In a mussel shell from the filler, a content of CuO ~ 0.3 wt.% was found.

Similarly to the *dromos* plaster, the beach sand used as filler in the plaster of the funeral chamber consists of fragments of mollusc fauna (mussels and rarely of periwinkles) and sporadic quartz and plagioclase. For fine-grained layer 3a, crushed calcite crystals were added to the initial lime mortar. An enhanced whiter colour was attained in layers 2 and 3a by adding crashed calcite. For fine-grained dark-blue layer 3b, besides crushed calcite, ground charcoal was added to the primary lime mortar.

The chemical compositions of the binder in the three plaster layers are very similar and include mainly (in wt.%) $CaCO_3$ (92.5-96.4), SiO_2 (2.1-4.7, Al_2O_3 (0.7-1.3), MgO (0.3-0.6), Fe_2O_3 (0.4-0.6), CuO (n.d.-0.3) and in minor amounts (<0.3) - Na_2O, SO_3, MnO, TiO_2 and Cl (Table 15). The presence of copper and lack of phosphorus seem to be an indicative property of the binding material inherited from the initial raw material. It is noteworthy that the presence of copper was also found in a mussel shell from the filler. The IR spectra of the binding material in layer 1 are similar to the binder spectra in layers 1 and 2 of *dromos* (Figure 154/e).

Colour decoration

The paint palette used for murals in the funeral chamber includes dark blue, red, yellow and white colour (Figure 155/a-e). It was found that all the initial paints used for the colour decoration of the tomb represented a mixture of liquid slack-lime binder and pigment. The term 'pigment' is used for a colouring substance in a binder media.

There are several techniques used for mural painting, i.e. *fresco* when paint is applied on wet plaster, and *secco* when the plaster is dry (Piovesan *et al.* 2012).

A dark-blue layer, *c.* 1 mm thick, was applied to the relief belt (layer 2) and on the lower part of walls of the chamber (Figure 152). Optical microscopy and SEM study shows that the dark-blue paint colour was attained by mixing lime binder, calcite filler and charcoal as colouring material (Figure 156/f). This charcoal can be specified as 'carbon black' pigment.

Angular grains of calcites, 0.1 mm - 0.5 mm, of finely ground marbles were added to the paint to increase lustre. Larger, elongated charcoal grains are oriented in the direction of paint application. In the contact zone between layer 3d (dark blue) and the underlying plaster layer (layer 2) there is no penetration of charcoal particles into the plaster. This means that the paint/mortar was applied to the dry plaster and that the *secco* painting technique was used (Figures 155-156).

The chemical composition of the binding material in the dark-blue layer is the same as that for the chamber plasters (Table 15, analyses 4-7).

Table 15 Representative electron probe microanalyses of plasters (binders), paints, pigments, limestone materials (in wt.%).

An. N	Na_2O	MgO	Al_2O_3	SiO_2	P_2O_5	SO_3	Cl	K_2O	CaO	TiO_2	MnO	Fe_2O_3	CuO	As_2O_5	CO_2*	$CaCO_3$
	Dromos plaster binder: layer 1 (an. 1), layer 2 (an. 2), layer 3 (an. 3)															
1	0.08	0.41	0.89	2.79	0.13	0.30	0.09	0.16	52.98	0.08	n.d.	0.53	n.d.	n.d.	41.58	94.55
2	0.27	0.18	0.82	3.16	0.12	0.36	0.07	0.04	52.88	n.d**	0.18	0.42	n.d.	n.d.	41.50	94.38
3	0.18	0.74	1.74	5.27	0.45	0.37	0.06	0.17	50.54	n.d.	0.07	0.75	n.d.	n.d.	39.66	90.20
	Chamber plaster binder: layer 1 (an. 4), layer 2 (an. 5), layer 3a (an. 6), layer 3b (dark-blue) (an. 7)															
4	0.12	0.28	0.69	2.03	n.d.	0.18	0.08	0.09	53.64	n.d.	0.12	0.40	0.28	n.d.	42.09	95.73
5	0.16	0.58	0.94	3.51	n.d.	0.18	0.14	n.d.	52.41	n.d.	n.d.	0.64	0.30	n.d.	41.13	93.54
6	0.06	0.38	1.29	4.73	n.d.	0.28	n.d.	n.d.	51.80	0.04	n.d.	0.47	0.30	n.d.	40.65	92.45
7	0.24	0.64	0.70	2.11	n.d.	0.21	0.05	0.05	53.46	n.d.	n.d.	0.57	n.d.	n.d.	41.96	96.42
	Red decoration in Chamber: hematite (α-Fe_2O_3) (an. 8), red paint (an. 9)															
8	0.27	0.38	2.23	4.94	n.d.	0.17	0.14	0.10	12.25	n.d.	0.09	68.30	0.33	1.19	9.60	21.85
9	0.41	0.55	2.17	5.94	n.d.	0.22	0.12	0.11	43.73	n.d.	n.d.	11.57	0.30	0.58	34.31	78.04
	Yellow decoration in Chamber: goethite (α-FeOOH) (an. 10), yellow paint (an. 11)															
10	0.23	0.52	0.81	2.43	0.22	0.37	n.d.	n.d.	2.95	n.d.	n.d.	91.75	0.53	n.d.	2.31	5.27
11	0.33	0.67	2.03	4.46	0.20	0.24	0.10	0.16	48.87	n.d.	0.15	4.15	0.28	n.d.	38.36	87.23
	White decoration in Chamber: white paint (an. 12)															
12	0.11	0.34	1.67	4.23	n.d.	0.21	0.08	n.d.	51.48	0.20	n.d.	0.32	0.39	0.98	40.41	91.89
	Sarmatian limestones in the vicinity of the tomb: limestone/marl (an. 13), red clay material (an. 14)															
13	n.d.	1.64	9.21	21.71	n.d.	0.12	n.d.	1.09	33.34	0.49	n.d.	5.97	0.24	n.d.	26.19	59.53
14	0.09	1.58	26.30	47.83	0.18	0.14	0.08	1.90	6.09	0.72	0.10	9.96	0.25	n.d.	4.77	10.86

* CO_2 content is recalculated from the content of CaO
** n.d. – not detected

Red paint, in a thin layer (0.1mm), covers a part of dark-blue panels (Figure 155/a, e). Optical microscopy and CEM examination show that the red paint is obtained by mixing lime binder, red earth pigment and crushed calcite as filler. The red earth pigment consists mainly of clay material and some amounts of hematite (α-Fe_2O_3). Besides these red pigments, particles of finely ground charcoal and native gold are found in the paint.

The clay material is not visualized as separate particles using the optical microscope and SEM – it forms completely homogeneous mixture with calcium carbonates, coloured red (Figure 155/a, e). Chemical composition of this mixture is strongly dominated by calcium carbonate (78 wt.% in analysis 9, Table 15) with other important components (in wt.%) SiO_2 (5.9), Al_2O_3 (2.2), Fe_2O_3 (11.6), CuO (0.3) and As_2O_5 (0.6).

Hematite is represented by grains 1-2 μm in size, containing Cu (up to 0.3 wt.% CuO) and As (1.2 wt.% of As_2O_5) (Figure 155/e, Table 15). The presence of hematite is confirmed by the Raman spectra obtained from the pigment – peaks at 227, 294, 411 and 612 cm^{-1} are typical for hematite (Figure 155/g). The peaks at 1087 and 712 cm^{-1} in the hematite Raman spectrum are related to the calcite $CaCO_3$ of the binding carbonate material.

White paint is applied to the dark-blue and red panels (Figure 155/e). The paint was originally represented only by a lime solution with no other additives. The chemical composition of the paint obtained by EPMA, besides CaO and CO_2 (~92 wt.% $CaCO_3$), shows the presence of such important components as (in wt.%) SiO_2 (4.2), Al_2O_3 (1.7), As_2O_5 (1.0) and CuO (0.4). The material contains relatively low amounts of iron (Fe_2O_3 - 0.3 wt.%) ((Table 15, analysis 12). The Raman spectra of the white pigment correspond to that of calcite with characteristic peaks at 282, 714 cm^{-1}, and a most intensive peak at 1087 cm^{-1}, related to the symmetric stretching (ν_1) of CO_3 groups of calcite (Figure 155/g).

Yellow paint was the last colour applied on the dark-blue and red panels (Figure 155/c, d). The yellow paint comprises yellow earth pigment and lime as a binder. The yellow earth pigment is represented by mixture of clay material and goethite, sporadically accompanied by hematite (Figure 155/d). Besides $CaCO_3$ (87 wt.%), the yellow paint contains (in wt.%) SiO_2 (4.5), Al_2O_3 (2.0), Fe_2O_3 (4.2), CuO (0.3) (analysis 11 in Table 15). It is notable that the yellow paint analysed by EPMA does not contain As_2O_5, and the presence also of Cu was not established in some analysed areas of the paint. The analysed goethite demonstrates a similar geochemical behaviour: no single analysis of the mineral shows the presence of As_2O_5, the content of CuO is very sporadic – from the levels below the detection limit of the method (~<0.1 wt.%) to 0.5 wt.% (analysis 10, Table 15). The Raman spectrum of the yellow paint (Figure 155/g), besides the well pronounced and narrow peaks of calcite binder (at 1087, 282 and 712 cm^{-1}), shows the presence of an intense peak at 387 cm^{-1}, and other peaks at 248, 299 и 550 cm^{-1}, typical of goethite α-FeOOH. Additional peaks at 294 and 410 cm^{-1} indicate the presence of small amounts of hematite.

Materials used for preparation of mortars and colour decoration

Materials used for primary mortars

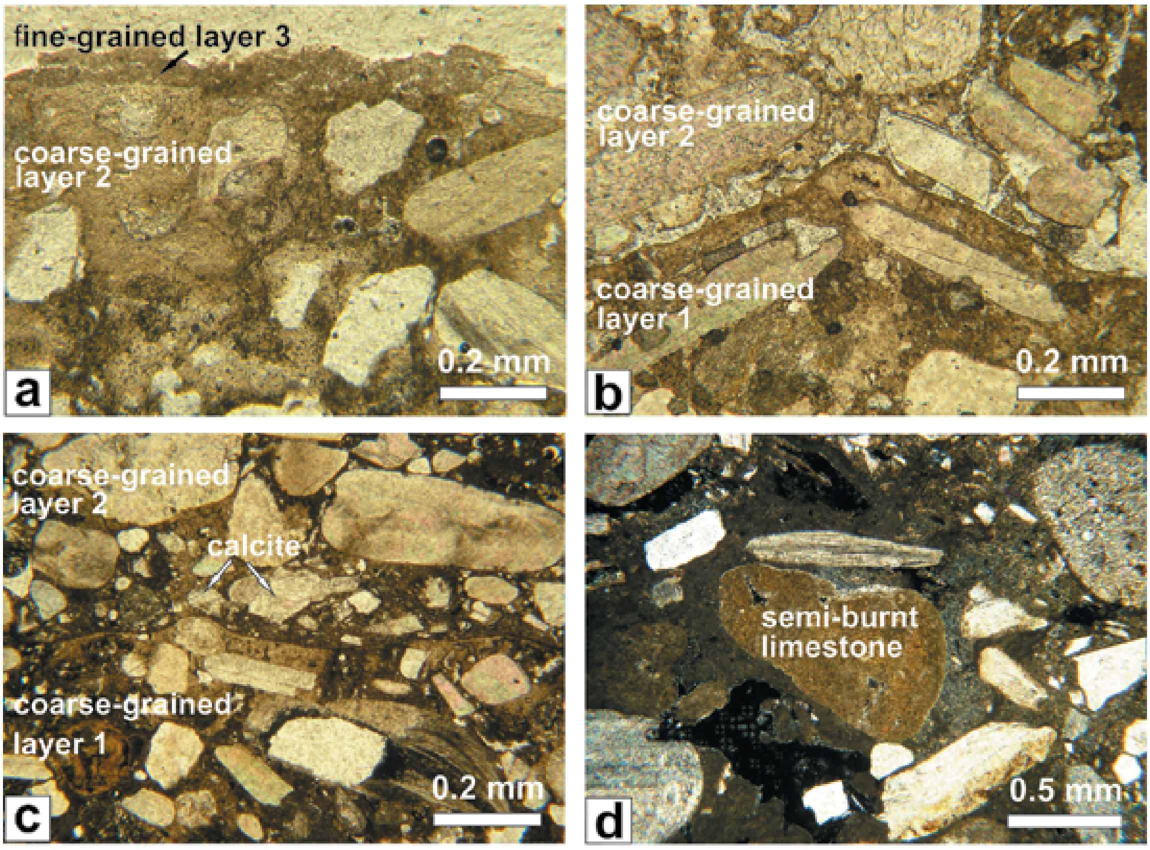
The principal constituents of the *dromos* and chamber plasters are lime as binder and beach sand as filler.

Lime. In the southern Dobrudja region, Sarmatian organogenic limestones with thin layers of red clays are widespread (Ţenu, Davidescu 2005; Filipov 1995; Popov, Koyumdzhiva 1987). The limestones are karstified and their cavities are coloured rusty-reddish by ferric iron oxides (Figure 156). In limestones, imprints of shallow-sea fauna are well distinguished. The found pieces of semi-burnt limestones chosen for the production of lime, for further use in the tomb, show mollusc fauna typical of Sarmatian limestone. These molluscs are represented by mussel (*Lamelibranchiata*) and helix (*Gastropoda*) classes (Filipov 1995). The composition of organogenic limestones, found 10 m - 15 m from the tomb, shows the presence of cupper 0.2-0.3 wt.% CuO, which is close to those found in the plasters of the chamber (Table 15).

The presence of CuO and similar mollusc fauna in the tomb plasters and in the adjacent limestones can serve as evidence of the production of lime from local raw materials.

The chemical compositions of the lime used in the *dromos* and chamber plasters are close. The main difference is that the *dromos* lime contains phosphorus 0.1-0.5 wt.% P_2O_5, while the lime in the chamber contains copper up to 0.3 wt.% CuO. The slight differences in the chemical composition of the lime used can indicate that the raw materials for lime production were taken from different places (quarries) of the area.

Sand. Sand was added to the plasters of the Documaci tomb to increase its strength. The sand mainly consists of shells of mollusc fauna 85-90%, quartz 5-10%, plagioclase 2-5%, single grains magnetite, rutile, amphibole, biotite, barite, rock fragments of epidote-chlorite aggregates, as well as pieces of limestone with fossilized mollusc shells. According to Sotirov (2003), the composition of the modern beach sand in south Dobruja is similar to that used for filler by the ancient craftsmen. The beach sand of south Dobruja is formed by the destruction of Sarmatian limestones on the submarine slope of the Black Sea coast (Sotirov 2003).



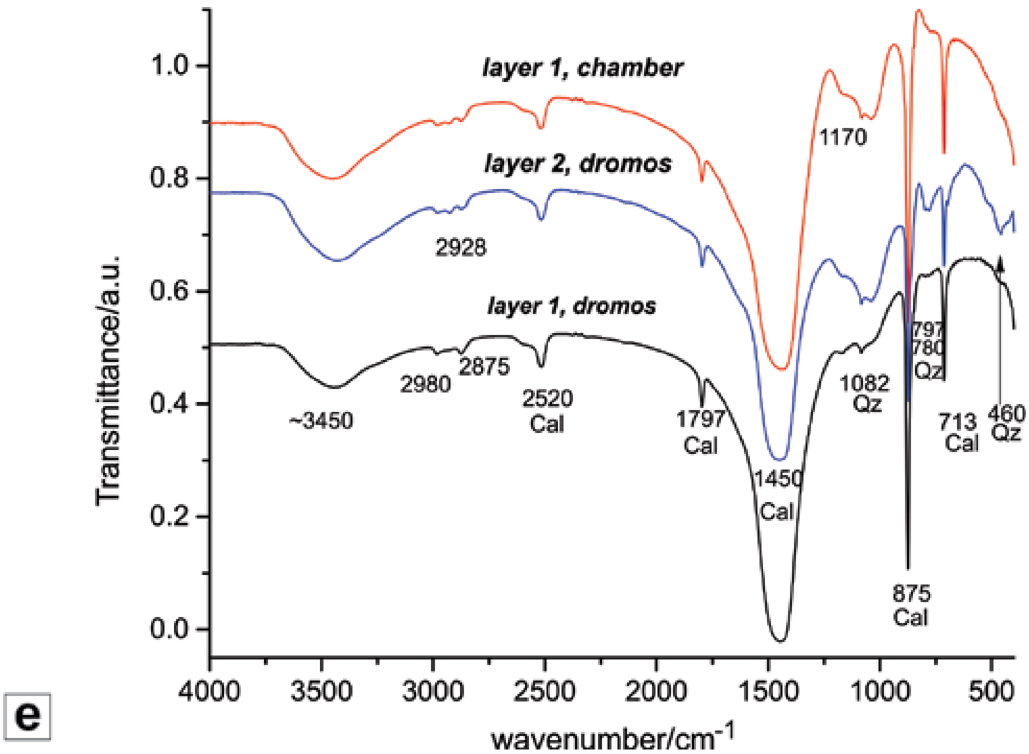


Figure 154. Cross-sections of the *dromos* plaster in transmitted light (parallel polarized light): a) contact of layer 2 and fine-grained layer 3; b) contact of layers 1 and 2, filler – beach sands consisting of fragments of mollusc shells. Cross-sections of the chamber plaster in transmitted light (parallel polarized light): c) contact of layers 1 and 2, filler – beach sands; d) coarse-grained layer 2 with piece of semi-burnt limestone; e) IR spectra of binding material in plasters from *dromos* and funeral chamber.

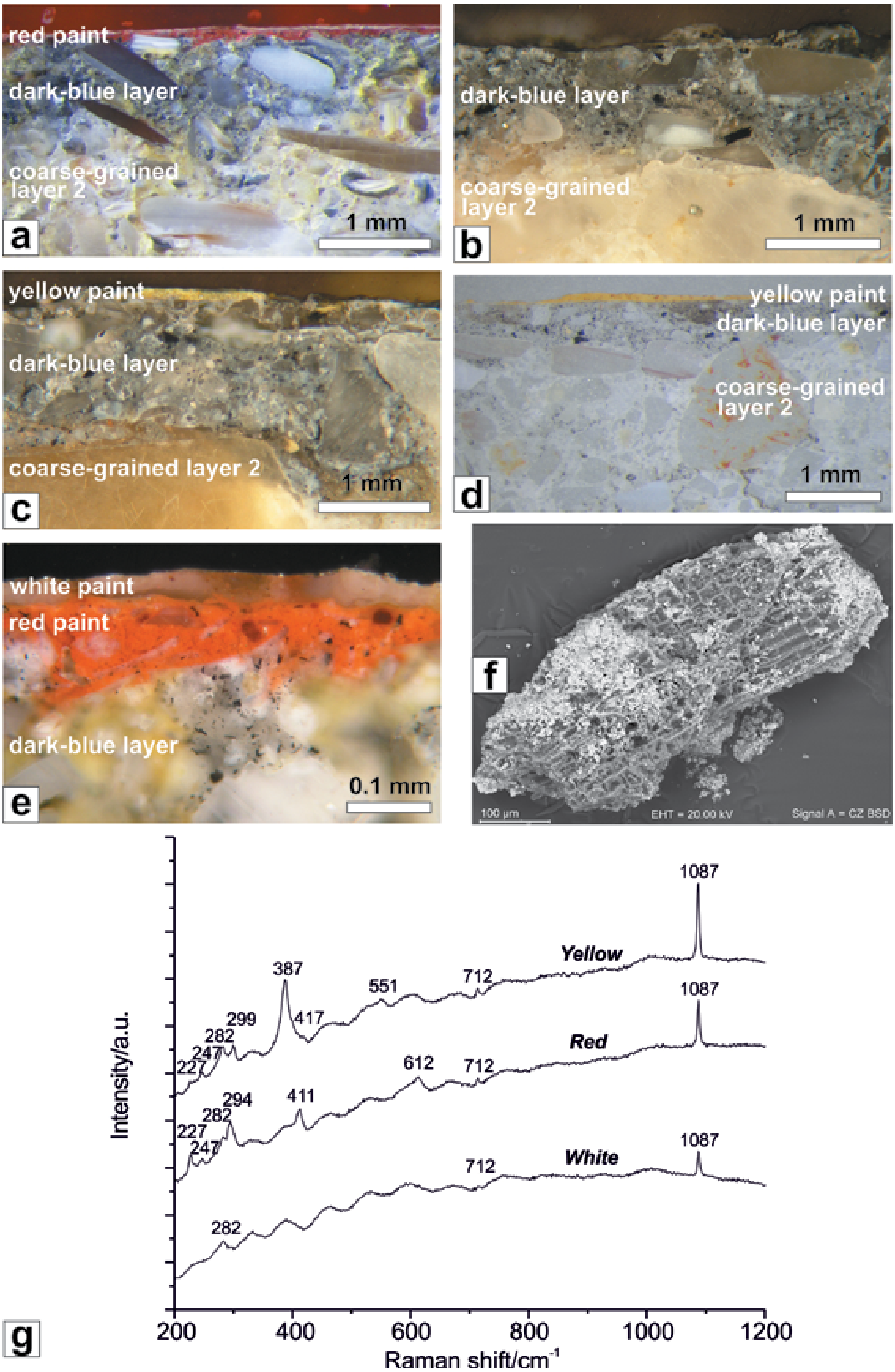


Figure 155. Cross-sections of the chamber plaster and colour decoration (binocular stereomicroscope images): a) coarse-grained layer 2 – dark-blue layer 3b – red paint; b) coarse-grained layer 2 – dark-blue layer 3b; c) coarse-grained layer 2 – dark-blue layer 3b - yellow paint; d) coarse-grained layer 2 – dark-blue layer 3b – yellow paint; e) dark-blue layer 3b – red paint – white paint (dark-red aggregates – hematite); f) burnt wood (charcoal) with clear cellular structure from dark-blue layer 3b. BSE image, SEM; g) Raman spectra of white, red and yellow paints.

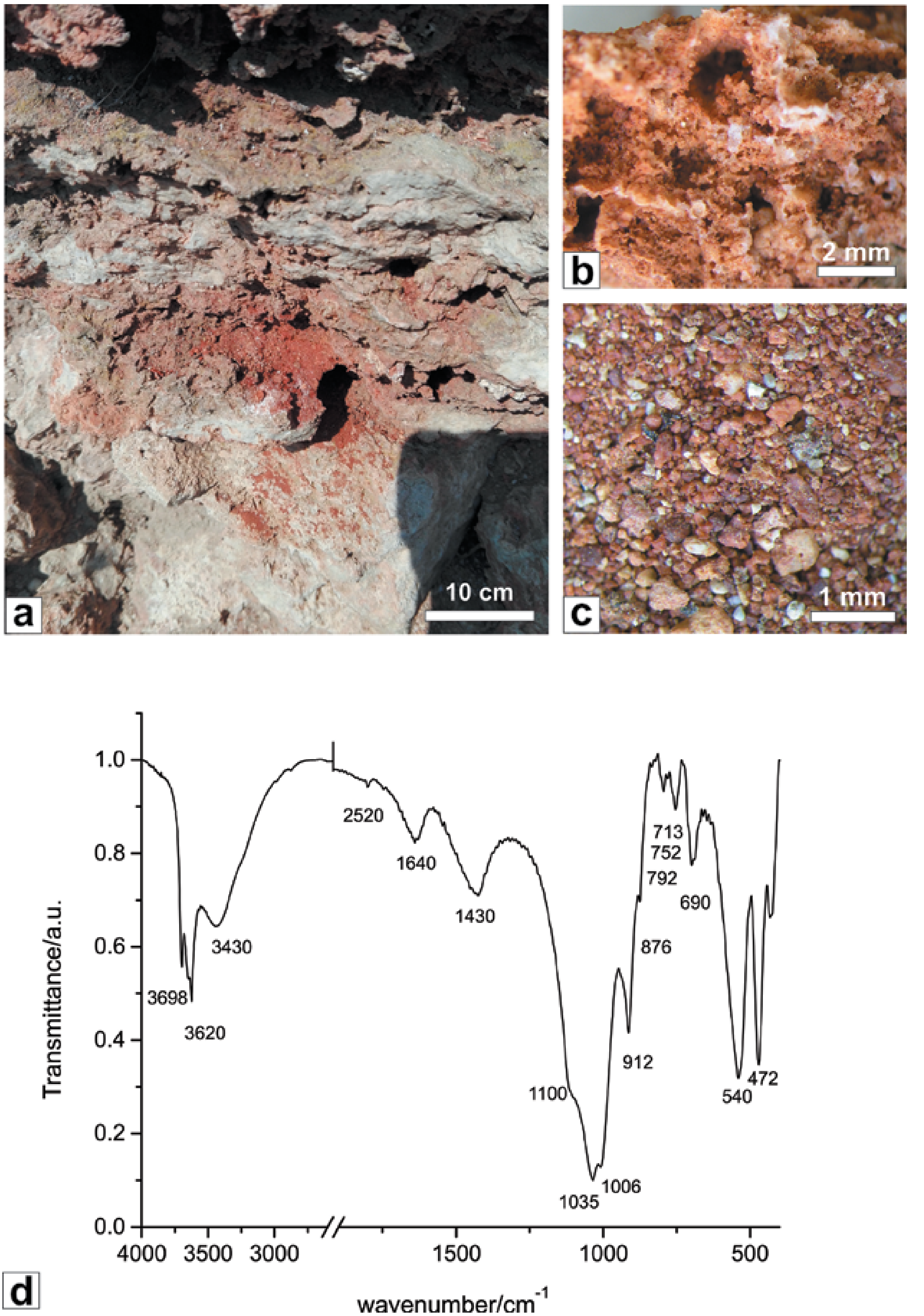


Figure 156. a) Natural outcrop of cavernous Sarmatian limestones in close proximity of the tomb; b) Cavities with recrystallized calcite and coats of red clays and ferric iron oxides (detail of Figure 4a); c) Red ochre material (calcite, clay, ferric iron oxides) (detail of Fig. 156a); d) IR spectrum of red ochre material from the limestone.

The similarities found in the composition of the sand used in the plaster in the tomb and that of the beach sands indicate that the ancient craftsmen used the local source for the sand.

Colour decoration

Dark-blue colouring. Carbon black (charcoal) was used to attain the dark-blue colouring. As detected by SEM, the black pigment preserves the cellular structure of burnt wood.

Red ochre is most widely spread and easily available inorganic pigment from ancient times. Commonly, it is represented by hematite, α-Fe_2O_3, in different proportions, with clays and sands. Red clays with ferric iron oxides are found in Sarmatian limestones in the vicinity of the tomb. The extracted reddish material of these limestones when studied by IR spectroscopy shows the presence of clay mineral kaolinite, calcite and hematite (Figure 156/d, Table 16).

It is noteworthy that in the chemical composition of the clay material taken by us from Sarmatian limestones adjacent to the Documaci tomb there is an essential content of copper (0.2-0.3 wt.% CuO) and iron (~10 wt.% Fe_2O_3) (Table 15, analysis 14). This means that clay and ferric iron oxide materials contained in the limestone adjacent to the tomb are a potential source of red natural pigment used in the decoration of the tomb.

Yellow ochre. Although we do not observe any distinct yellow material in the limestone adjacent to the tomb, the detected content of copper (0.3-0.5 wt.% CuO, analyses 10, 11 in (Table 15) in the yellow paint and goethite from the tomb, give reason to assume that initial raw material for the tomb's yellow decoration was extracted from clay layers in Sarmatian limestone.

White paint. The presence of copper (0.39 wt.% CuO) and arsenic (0.98 wt. % As_2O_5) in the composition of the white paint (calcium carbonate) is an indirect sign that, similarly to the tomb plasters, local raw materials (limestone) were used for the production of lime for the white paint. The sporadic and uneven presence of As and Cu in the plaster binder and paints can indicate that the local limestones used for lime production varied in composition.

Applied ancient techniques

Clarification of the sequence of plaster application and the relationships of the plasters with the components of coloured layers provide valuable insights into the techniques used.

The usual lime cycle used since ancient time consists of three stages: (1) calcination of limestones, when calcium carbonate ($CaCO_3$) is converted to calcium oxide (CaO) by baking at temperatures to 650-900° C, (2) hydration or slaking with water – converting CaO

Table 16 IR spectroscopy data for reddish-brown clay material extracted from Sarmatian limestones adjacent to the Documaci Tomb: band's position, assignment and identified mineral phase.

IR peak	Assignment	Mineral phase
2520	Combination mode	Calcite
1430	asymmetric stretching v_3 of CO_3	
1100 shoulder	symmetric stretching v_1 of CO_3	
876	out-of-plane bending v_2 of CO_3	
713	in-plane bending v_4 of CO_3	
3698, 3620	OH stretching of hydroxyl groups	Kaolinite
3430, 1640	O-H stretching and H-O-H bending	
1100, 1035, 1006	Si-O stretching	
912	Al-OH stretching	
752, 790	Si-O-Al	
690	Mg/Al-OH	
540	Si-O-Al bending	
472, 424	Si-O bending	
540-424	Modes of α-Fe_2O_3	Hematite

Table 17 Stratigraphic sequence of colour painting in the Documaci tomb.

Colour of paint/plaster	Pigment	Binder media	filler
Dark blue (plaster)	Charcoal	Lime	Calcite
Red	Red ochre	Lime	Calcite
Write	Lime	Lime	No
Yellow	Yellow ochre	Lime	No

to $Ca(OH)_2$, and (3) carbonation of $Ca(OH)_2$ – formation of $CaCO_3$.

The plaster in the Documaci tomb consists of 3 layers (Table 12, Table 14). The contact zones between the layers are not contaminated, which indicates that the layers were applied one after another without a long-time interval, probably after the previous layer was hardened. The obtained characteristics of the plaster in the chambers and *dromos*, such as the chemical composition of the lime binder, the phase composition of the filler (sandy beach), the addition of crushed marble to the last layers to enhance the shine, indicate the use of the same techniques when applying the plaster to the chamber and the *dromos*.

The paint palette used for murals includes dark blue, red, yellow and white colours. To obtain colour effects, paints and mortars consisting of lime binder and pigment were used. The following pigments were selected: charcoals for dark blue; kaolinite-hematite mixture for red; kaolinite-goethite mixture for yellow; and lime for white.

A summarized sequence of coloured layers (plaster/paints) featured in the Documaci tomb is presented in Table 17.

The adding of calcite crystals to mortars and paints to increase their lustre, as well as the use of ground wood charcoals as a pigment, are widespread and accessible technologies frequently applied in Thracian tombs at the time Documaci was built. Thracian examples (4th-3rd c. BC) include Shushmanets and Dolno Lukovo, today in Bulgaria (Nekhrizov *et al.* 2017; Tarassova *et al.* 2014).

Conclusion

The Documaci tomb is plastered in three layers. For the preparation of the primary mortars, local row materials of Sarmatian organogenic limestone and coastal beach sand were used. Earth pigments, i.e. red ochre (hematite + clay) for red paint, and yellow ochre (goethite + clay) for yellow paint. Wood charcoal for dark-blue colouring, and lime for white paint were also used in the decoration of the tomb's murals. All these pigments have a local origin – from Sarmatian limestone (lime) or from red clay layers of the same limestone (clay, hematite, goethite). It became clear that the *secco* technique was applied for the wall painting.

Built on the Black Sea coast, in Thracian territory, the Documaci tomb demonstrates both the features of Early Hellenism in its architectural style and the techniques for plastering and colour painting, mirroring methods used in the Thracian tombs from neighbouring territories. Thus the Documaci tomb reflects local craft traditions and influences of cultural interactions and communications of the period.

Microscopic analyses of the floor and wall plasters

Valentina Cetean

During both the 2017 and 2018 campaigns, investigations were made into how the tomb walls (the funerary chamber and *dromos I)* were finished with mortar and plaster, based on microscopic observations of fragments collected from the current walking level in the tomb by archaeologists during the initial cleaning stage of the monument (2017). These fragments probably fell from the walls between 1995 - 2017, as a result of degradation processes. Two of the fragments, from the *dromos I* area, suitable in size for thin sections, were analysed at the Geological Institute of Romania.

The mortar fragments that formed separate analysis samples[12] had different sizes and shapes. Four samples

[12] They were observed with a binocular magnifying glass (stereographic microscope) Zeiss STEMI 508, with a magnification of up to 50x and equipped with a Zeiss digital camera. The magnifying power of the eyepiece is 10x, and of the lens from 0.63x, to 5x (0.63x, 0.8x, 1x, 1.25x, 1.6x, 2x, 2.5x, 3.2x, 4x, 5x), respectively by microscopy optics in polarized light. For general observations the Zeiss-Jena Jenapol optical microscope was used, and for details and measurements the Zeiss AXIO IMAGER A2m optical microscope with magnification power up to 500X and equipped with four lenses with different magnification powers, i.e. 10x, 20x, 40x and 50x , and 10x magnification eyepieces, in turn equipped with a Zeiss digital camera.

Table 18 Samples of mortars analysed under magnifying glass and binocular microscope.

Nr.	Mortar sample cod	Location	Thin section
1	MD17-K.21	Funerary chamber collected from the current walking level. 2017	x
2	MD17-K.22	Dromos I – northern wall area, eastern limit; collected from the current walking level. 2017	x
3	MD18-K.01 (K18-1)	Funerary chamber – trench S9, sq. 2, Feature 4, 0.45-0.65 m beneath the wall plinths. 2018	x
4	MD19-K.01m	S9, C1 (from plinth upwards). 2019	x

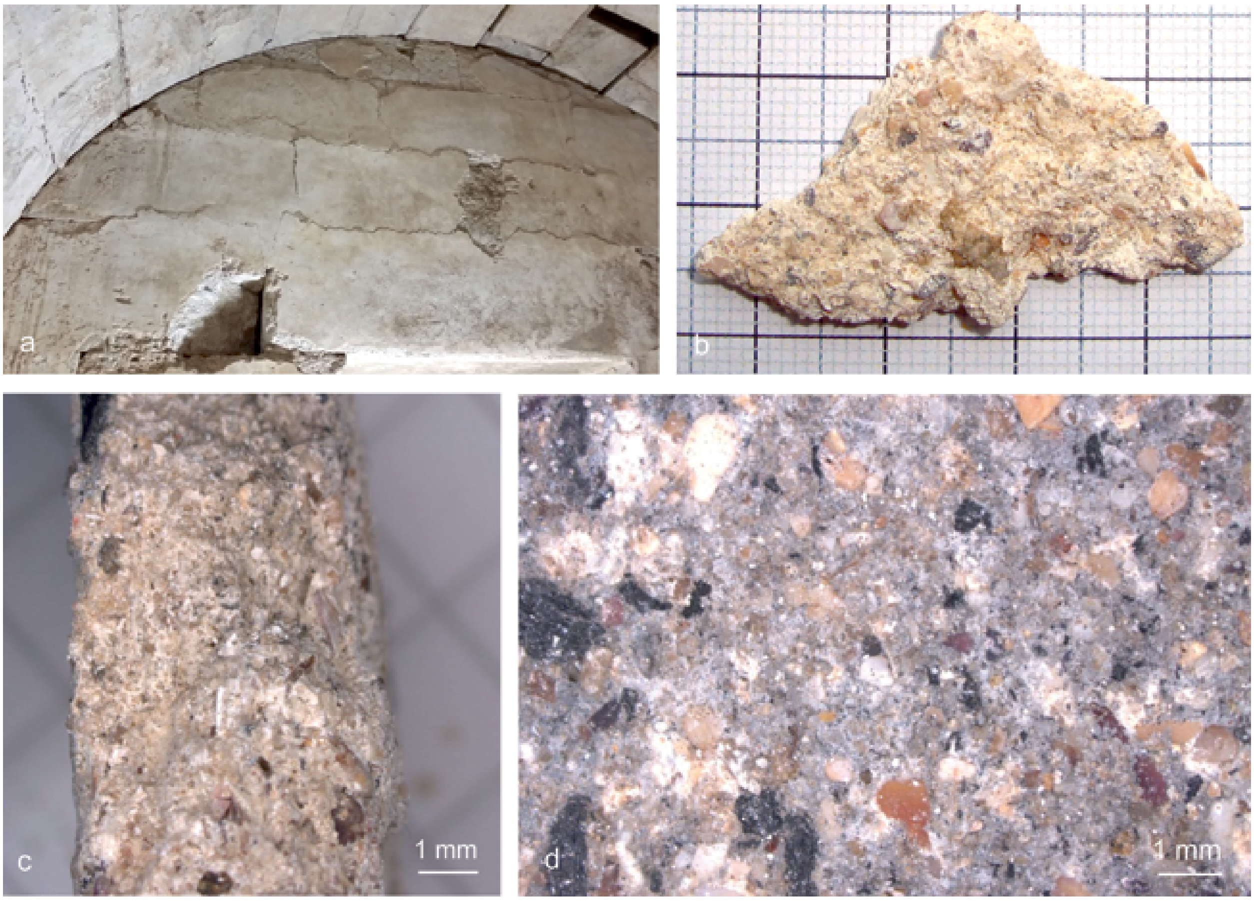


Figure 157. a) Eastern wall of the funerary chamber; b) fragment of brownish-whitish mortar, in which the quartz granules from translucent to yellowish and grey are clearly observable, their edges being rounded to subangular; sorting is medium to weak in the size range 0.5 mm - 3 mm, but uniform overall; c) the thickness of the level of mortar with plaster does not exceed 5 mm - 8 mm; c) although less than 1 cm thick, the mortar was deposited in several successive levels, of which the base is obviously coarser and of a greyer shade, followed by a slightly finer subcentimetric level and an obviously smoother and better final layer The main compounds are carbonatic clasts, fossiliferous remains, tabular-prismatic granules of crushed coal, but also granules from subangular to sub-rounded white, grey, brown or brick translucent quartz, in varying degrees of opacity; d). the grey layer of mortar includes angular to subrounded psamitic size clasts in a carbonatic binder; the grey colour is due to large to small fragments of charcoal.

(Table 18) were analysed under a magnifying glass and binocular microscope. Three were prepared on thin sections and optically analysed in polarised light for mineralogical compounds.

The total thickness of the mortar layer does not exceed, over the majority of the surface, 1 cm (Figure 157/c), generally varying between 0.3 and 0.8 cm (Figure 157/a-b), being composed of three levels (sub-layers), visually

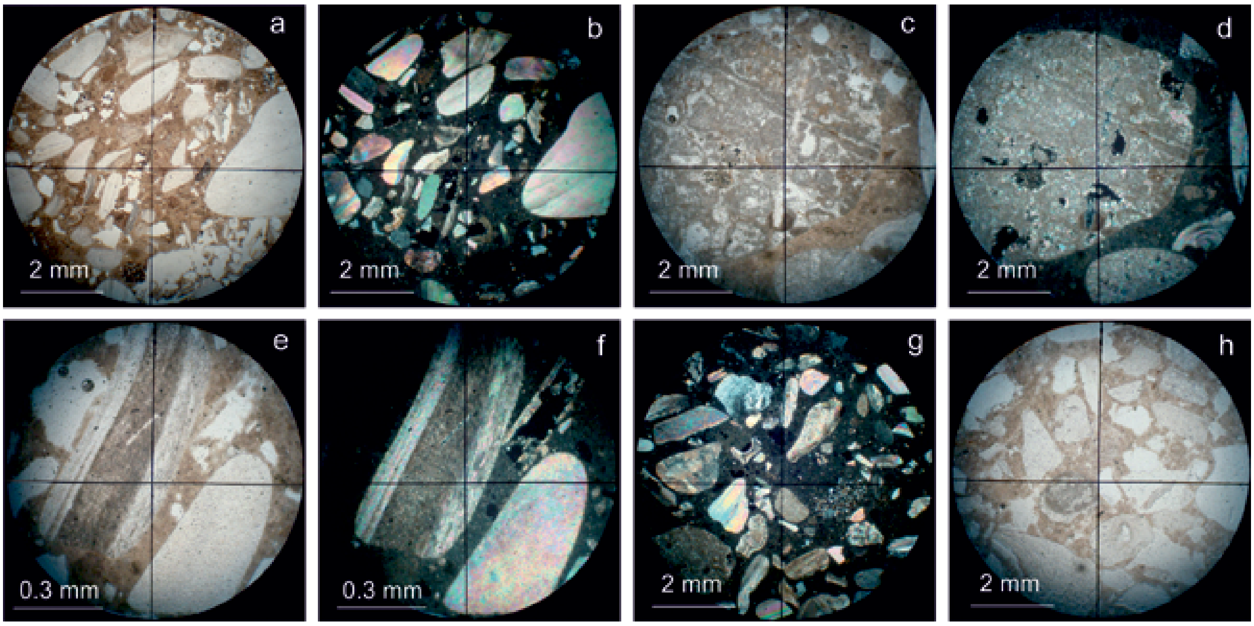


Figure 158. Microscopic images of MD17-K.21 mortar sample (funerary chamber). Angular to rounded shape of fragments, including monocristallyne clasts (quartz, feldspar, shell scraps, heavy minerals, hornblende) and extraclasts rock fragments (micritic or sparitic limestone, volcanic or metamorfic siliciclasts), into a lime matrix (polllarized light: a, c, e, h - parallel nicols; b, d, f, g - crossed nicols)..

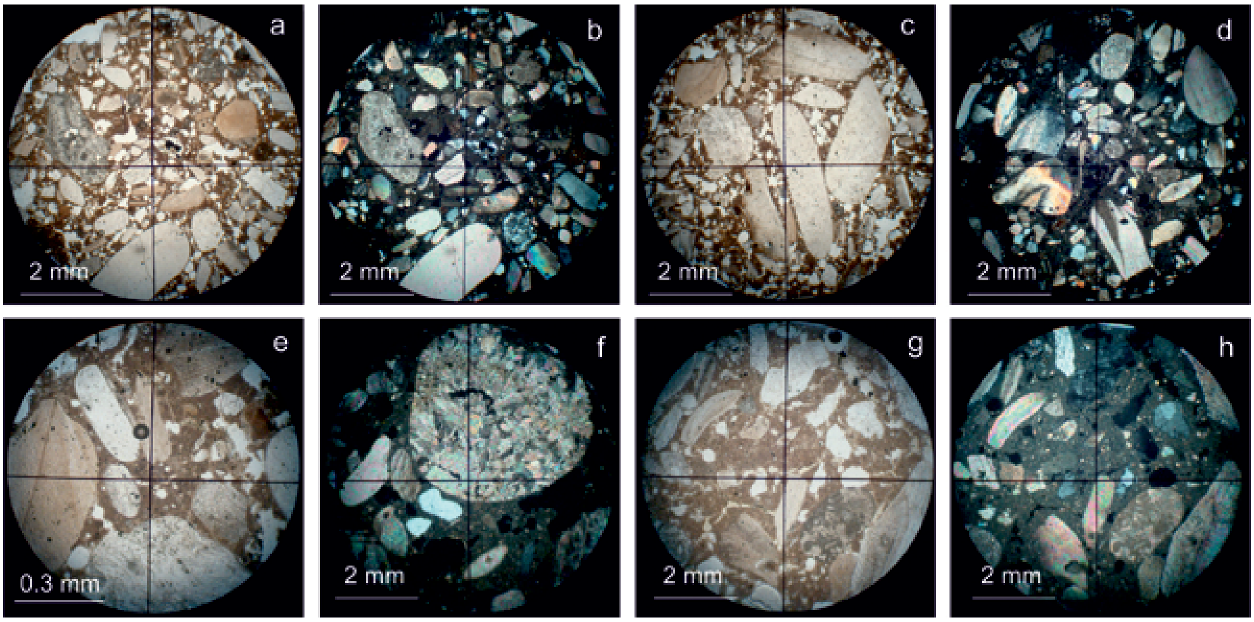


Figure 159. Microscopic images of MD17-K.22 mortar sample (*dromos I*), showing typical textural aspect (generally rounded shape of intraclasts into a carbonatic matrix) and the mineralogical composition: quartz, pearly scraps of shells, feldspar, carbonatic clasts, elongated coal fragments, heavy minerals and polycrystalline extraclasts (polllarized light: a, c, e, g - parallel nicols; b, d, f, h - crossed nicols)..

differentiable in some samples (Figure 157/d) by the slightly lighter shade of the outer layer and by a relative difference in the size of the mineralogical components that make up the fragments. The intermediate layer is 10-30% thinner than the base, which is determined by the mixture with fragments of ground shells (hence the more angular appearance), not taking into account the very fine smoothing layer in the upper half of the burial chamber (Figure 157), whitish in colour, most likely made of compact lime milk and with very finely ground carbonate granules.

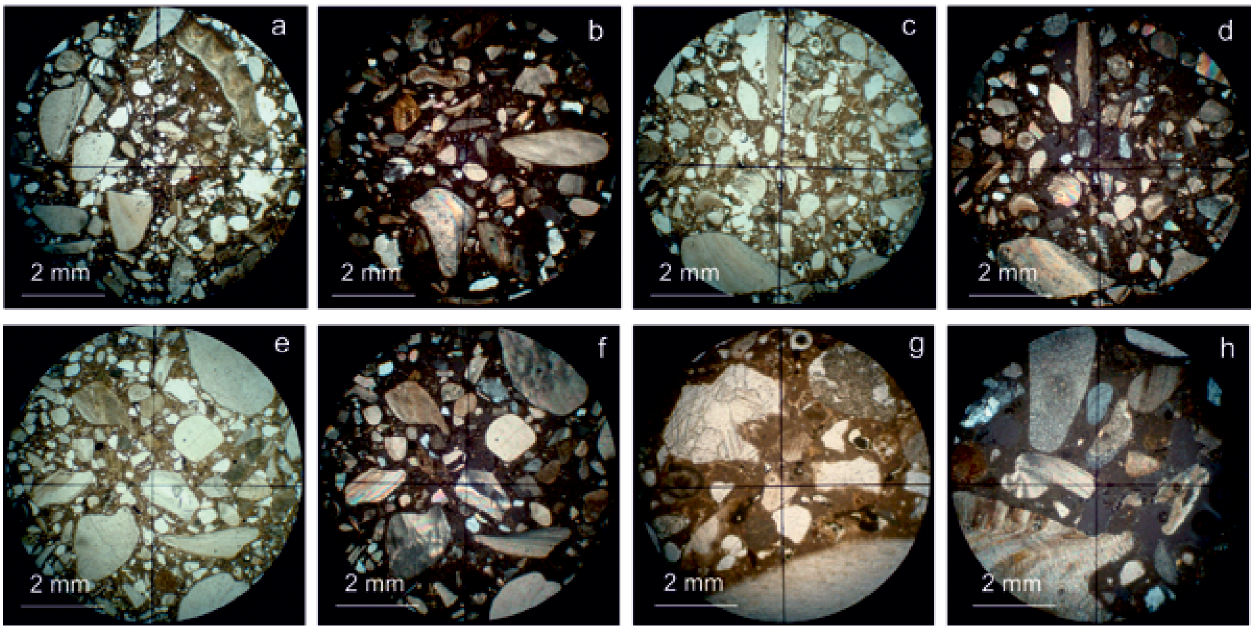


Figure 160. Mortar sample K18-1 (funerary chamber, trench S9, 2018) (polllarized light: a, c, e, g - parallel nicols; b, d, f, h - crossed nicols).

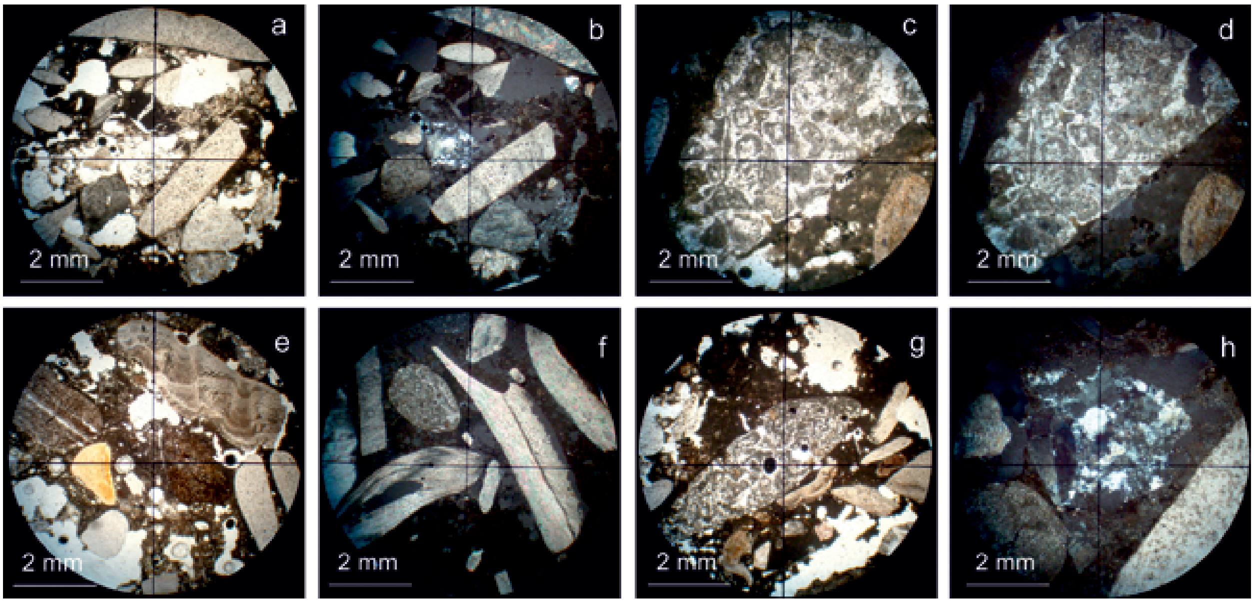


Figure 161. Mortar sample K19-03.06 from funerary chamber, trench S9, 2019 (polllarized light: a, c, e, g - parallel nicols; b, d, f, h - crossed nicols)..

The mineralogical constituents are similar for all samples of mortar, both from the funerary chamber and the *dromos I* (Figures 158-161), represented by:

35-50% shell granules (fragments of bivalves, sporadically gastropods) made of calcite (rarely aragonite) with a pearly appearance, with predominantly rounded and sub-rounded shapes (Figure 158) (hence a maturity of the deposit from which they were taken), and shades from white to brownish-white and pinkish-white (Figure 157/d); in the intermediate layer (the one immediately above the base level), fragments of shells were mixed, obviously angular, resulting in a finer-looking material. 8-15% quartz granules generally translucent and subangular-subrounded, from milky white to yellowish-brick, grey of different shades to opaque brown; in the base layer the psammitic granules can reach 3 mm - 4 mm. 40-50% is the embedding binder of the fragments, respectively a carbonate matrix of micron dimensions and sporadically of sparitic type, resulting from isolated secondary crystallizations.

0.5-3% feldspar granules and fragments of lithoclasts: quartzites – gneisses and igneous rocks, sandstones, organogenic limestones or chemical precipitation, etc; rarely do the feldspars have macules, and rock fragments are generally larger and with a more rounded habitus. 0.5-2% granules of variable dimensions (the largest up to 3 mm - 5 mm, but with a preponderance in the range of 0.5 mm -1 mm, to which are added the finely ground ones. <1% opaque minerals (e.g. brown hornblende) and heavy minerals.

The predominantly carbonate composition of the mortar binder was also highlighted by electron microscopy analyses, demonstrating the methodology of building construction materials in the vicinity of the location, thus minimizing the effort. Both the limestones (sources of carbonate material in the mortar to bind the granular components) and the coastal sands, the origins of the constituent granules (polymictic, but with a predominance of shellfish remains) were raw materials available 2 km - 5 km away.

There are obvious similarities between the mortar samples taken from the burial chamber (Figure 160, K18-1, K19-03.06) and *dromos I* (Figure 159). Although apparently the proportion of different mineralogical components is variable, they have the same particle size and similar mineralogical compositions. In all the samples analysed by optical microscopy, the predominant fragments are of limestone, shells and quartz, trapped in a carbonate matrix of micritic texture. The other elements are much smaller in quantity. This finding can give indications about similar mortar preparation techniques, i.e. the percentage of sand/binder and a relatively uniform source for the included construction materials.

Chapter 10

Analysis of Stones Found in the Area of the Funerary Complex of the Documaci Tumulus

Valentina Cetean

Inventory of stone elements

The funerary complex from the Documaci mound has stone as its main building material, similar to the pattern of constructions found in the Macedonian area, from the early Hellenistic period. As a result, for the purpose of the geo-archaeological knowledge of this site, the interdisciplinary project carried out between 2017-2019 included activities of geological identification and description of the stones found in the tumuli structures.

Since the rescue excavations of 1993, measurements and visual descriptions of the limestone blocks that form the *dromos*, tomb and pedestal have been made, as well as general characterizations of the fragments found on the ground. But up until this work, there were no systematic mineralogical-petrographic analyses for identifying and describing the varieties of limestones used for the funerary complex.

The current chapter shows the conclusions of the optical microscopy analysis performed on 26 thin sections from the sampled stone from the funerary complex during the archaeological campaigns, the degree of details being calibrated for the interdisciplinary understanding and correlation of such historical monument.

The description of the blocks that form the *dromos* and the tomb are separately presented in Chapter 8.7.1, as well as those related to the monument's pedestal (Chapter 7.5). Additionally, the extensive mineralogical information captured for the analysed stones will make the subject of a future scientific article.

Stone blocks and slabs

The most significant volumetric stone elements are the blocks used for the interior masonry, with its own funerary character (*dromos*, tomb, entrance), as well as the structure placed to the west of the funeral chamber, considered to be a pedestal and which most likely held a commemorative monument.

Although as important as the blocks (of paralellipipedic shapes) from a volumetric aspect, the slabs (having two dimensions at least twice as large as the third dimension) represented the constructive elements used on the floor, the *dromos* V-shaped rooftop (Figure 134), and for some masonry pieces of the outer pedestal. Their considerable size, construction, and abutment techniques are the elements that contribute to the maintaining of the good condition of the structures. At the same time, the limestones used for the blocks and slabs have kept their natural aspect, without breaking, despite their many varieties and their typical porosity.

Fragments with irregular shapes from the krepis wall, abutment walls, fillings

Based on the geophysical investigations carried out within the research, following which the spatial arrangement of the building elements was identified, nine archaeological sections were planned and excavated. Those that involved the outer walls and the abutment walls of the funerary complex revealed a significant quantity of stone fragments (debris) used for building, having different sizes and irregular shapes.

Inside the excavated trenches, the walls that form the *krepis* and the abutment walls (Figures 38; 66; 68) have their exposed surfaces aligned and almost planar, naturally or perhaps through rough carving (but without obvious traces of such processing). Sometimes these fragments are quite volumetrically consistent, the longest side reaching as much as 40 cm - 60 cm in length.

Some 30-40% of these fragments have sharp edges, mainly those with at least one flat face. Where the shape is that of a slab/flagstone, it can be noticed that the upper and lower faces give the appearance of layers, obtained by splitting on the strata layers, typical for the carbonate deposits of the surrounding area.

Regarding the visual aspect, there are evident similarities in colour, porosity and secondary processes to those limestones blocks from the funerary and pedestal structure (Figure 163). The petrographic varieties identified include all the subtypes from the blocks – from the compact ones to the more friable – many having a coloration from the limonite present in their cracks, on the surface of the layers or fossiliferous limestones, including the karst areas. This indicates that most fragments could have resulted from the sizing of the limestones to form the blocks, either from the

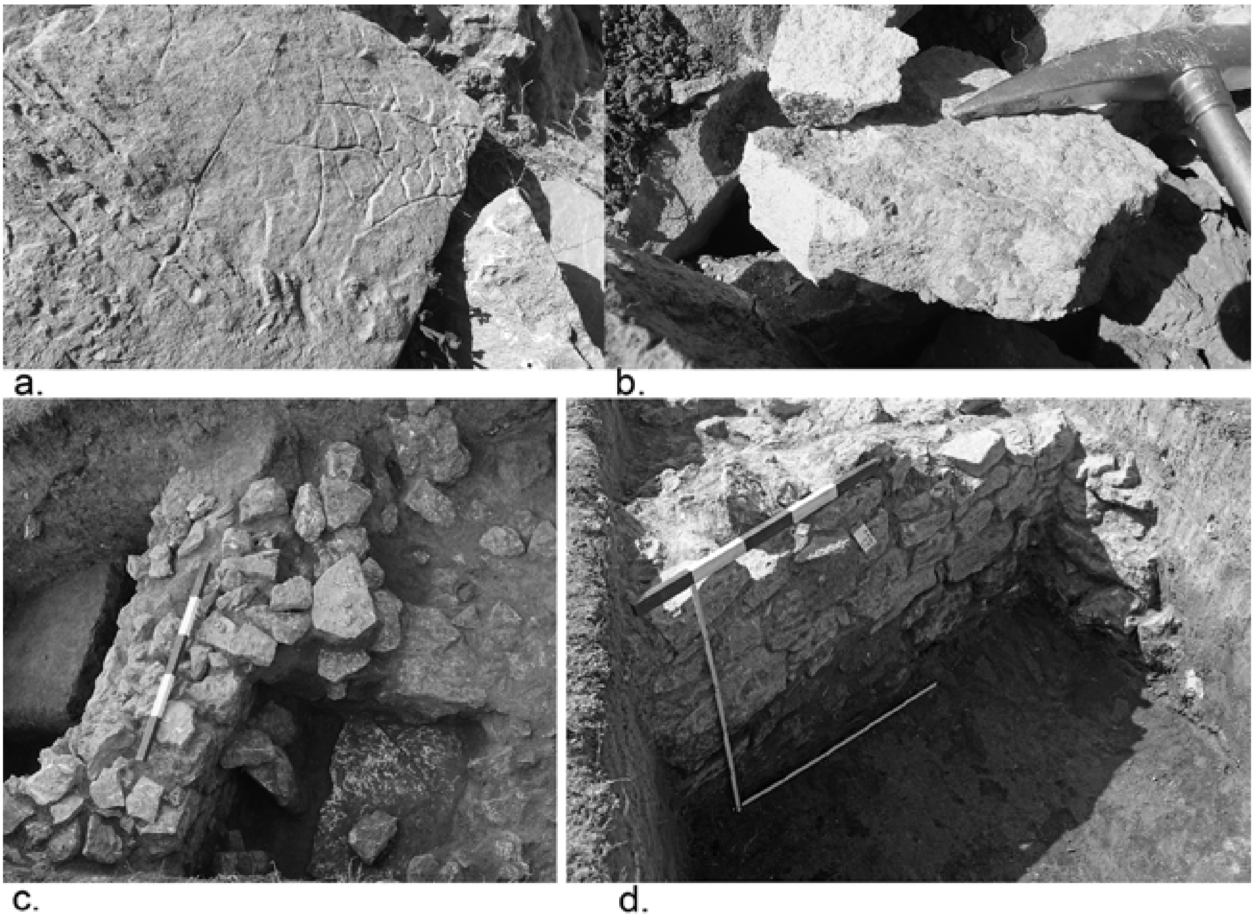


Figure 162. Irregular fragments of limestone used in the *krepis* wall (c-d), sometimes with a natural plane face; the stones present similarities with all fragments and blocks used in the funerary structures.

extraction zone, or near the site (which is more likely if one takes into consideration logistical efficiency).

Petrographic varieties

Limestones

Limestones are sedimentary rocks composed mainly (over 50%) of calcite and/or aragonite, in the form of petrographic constituents (components, binder), showing different structural and textural aspects. According to their genesis, the limestones from which the stone blocks used in the constructions from the Documaci site originate belong to three main categories: Calcium-carbonates precipitation (fine granular, allochemic), bioaccumulated, and detrial/ clastic (calcarenite) limestone.

According to the geology of the area (Figure 167), this type of carbonate deposits is found on both shores of the Mangalia and Limanu lakes, formed on the lower course of the Albești stream during the Sarmatian era (Besserabian and Kersonian subdivisions). As a result of the petrographic analyses made on the 21 limestone samples collected in 2017, from which eight were analysed on thin sections by optical microscopy, almost all petrographic varieties mentioned in the updated geological bibliography were distinguished. For a precise identification, they were grouped into categories, followed by petrographic classification after combined textural criteria and diagenetic processes:

Compact or friable limestone with small cardia +/- mactra fossils: biopelsparite (Figure 163/e), biomicrite = micritic limestone with small cardia. Bio-calcarenites (lumachellic limestone): biopeloid-calcarenite, peloid-limestone with bivalves (Figure 163/a-b), lumachellic limestone. Micritic limestone, micritic limestone with rhysoliths (Figure 163/d). Microsparite with nubecularia and small gastropods (Figure 163/c), lime-pseudosparstone with nubecularia. A further 16 sections were made from the samples collected within the archaeological sections opened during 2018-2019. Based on the recorded microscopic examination, the same categories of stones as those described above were identified, with a slight predominance of the limestones with bivalves (cardia), showing a medium to high porosity, and compact micrite limestones, more or less fossiliferous.

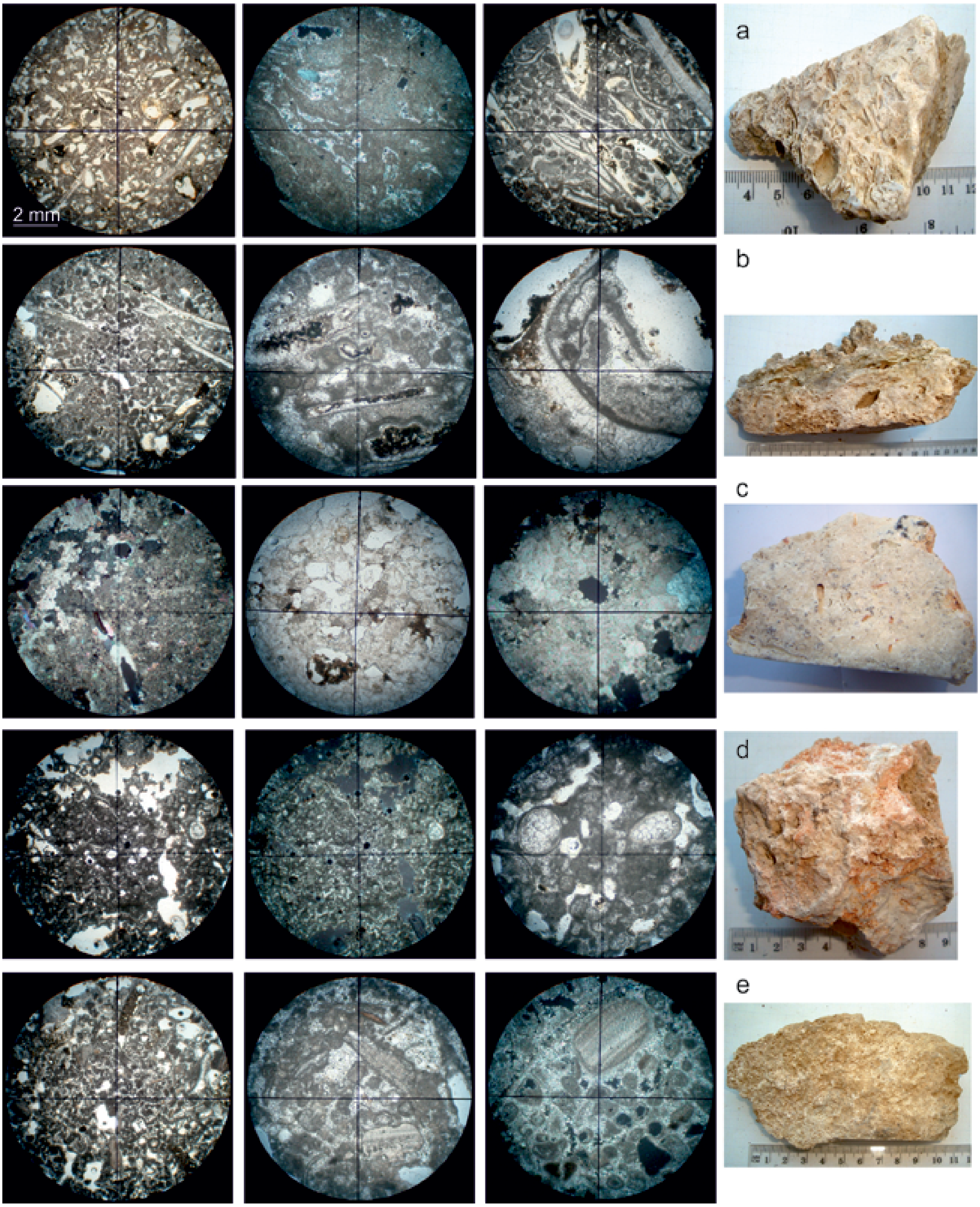


Figure 163. Limestone types found at the Documaci Mound funerary complex.

The limestone appearance is linked to their mineralogical composition, textural elements and secondary processes, such as calcitization (as thin films or depositions in cracks, with karstified aspect), limonitization (by leaching and deposition of limonitic minerals, especially inside the cavities or cracks corresponding to fossil remains), or even through the accumulation of clay minerals from the soils that covered them. The formation of a dark-grey protective layer is noticed for stone blocks in contact with air and water, whether it was caused by precipitation or from leaks through the system of cracks and holes.

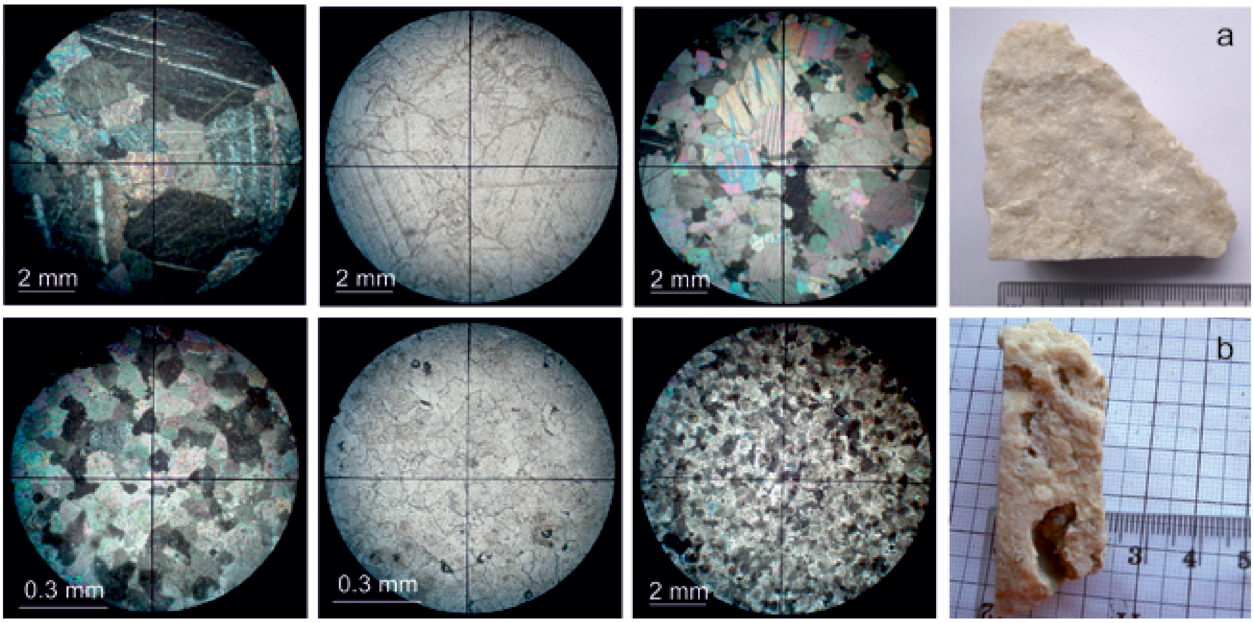


Figure 164. Other types of stones found inside the funerary chamber: a) marble; b) sparitic limestone.

The similarities between the petrographic types of limestone from which the blocks and slabs used at the Documaci princely tomb and the petrographic varieties from the Sarmatian deposits of Mangalia-Limanu-Albești area were confirmed. The existing differences in composition and appearance of some samples are due to normal facies variations (also confirmed for these stratiform deposits (Mutihac 1990) and to the fact that the prospecting made in the area of Limanu and Albești was performed only by visual observation and informative sampling. The site catchment analysis indicates that possible sources for the stone used were the limestone deposits from the surrounding area (a range of 2 km - 5 km), with relatively good workability, that allowed simple extraction from the strata, followed by sizing and splitting.

Diverse lithic fragments

During the stage of floor surface preparation inside the tomb, in order open the archaeological section S9, two small rock fragments were found, distinct from the limestone from which the stone blocks were made. Mineralogical analyses on thin sections obtained helped identify the type of rock, specifically:

A fragment of cream marble, with medium crystallinity (Figure 164/a), sporadic cracks and made in a proportion of 97-98% of calcite and 2-3% quartz, clay and limonitic minerals. An angular fragment of sparitic (large grains) limestone, yellowish, light-brownish (Figure 164/b).

A fragment of fresh granitoid rock, with a strong angular appearance, light grey colour, spotty aspect due to the presence of felsic (quartz, feldspar) and mafic (hornblende, chloritoid, sphene, opaque minerals); most probably this is an allogen fragment from modern times.

Regarding the origin of the marble, the 7.2 cm x 2.1 cm x 4.0 cm fragment found was probably from of the marble block(s) that were initially part of the sarcophagi (the recovered fragment is currently exhibited at the 'Callatis' Museum of Mangalia; Figure 117). The crystallinity of the marble is medium, with smooth edges, usual for this type of rock. Its colour varies from white to a yellowish-white (ivory), with the exposed surface calcitized, which determines its white-opaque shade. This clearly had both a decorating and architectural role, the durability of the marble being significantly higher than the limestone used for the stone blocks. Furthermore, the aesthetic characteristics of the marble (most likely brought from the Aegean area) were well known and valued in that period.

Examination of the potential geological area sources for the stone used at the funerary complex of the Documaci tumulus

Sarmatian deposits from the Limanu area

In the area that includes lakes Mangalia and Limanu, the Cotu Văii Formation is represented through horizontal stratiform deposits of Sarmatian age. The smaller extension is of that of rocks of Bessarabian age that shape the outline of the lakes in the form of a narrow strip, up to 10 m - 15 m wide. The carbonate rocks identified by previous studies dates these (mostly brittle) limestones to this period, containing small chunks of cardiacea, micritic and lumashellic (i.e. intensely fossiliferous) limestones with rhizoliths (fossilized roots), calcarenites (detrital, sand-grade limestone) with foraminifers from the *Nubecularia* family, and small gastropods.

The Kersonian deposits are above the Bessarabian ones and have a much wider vertical development and horizontally they emerge on wide surfaces. The studies, based on the 1:50.000 Mangalia map (Figure 32), indicated the presence of fine limestones (mainly of chemical precipitation) with fossilised remains in varying percentages, especially molluscs of the genus *Mactra* (Figure 165/g-j).

The largest extension of outcrops and sites for geological observation was on the left bank of Lake Limanu Lake, in a stepped quarry (Figure 165/a, c) that operated here until a few decades ago, particularly where the county road DJ 391B crosses the lake towards Limanu. This was also the main perimeter for observations and sampling, due to the extension of outcrops over a large surface area and to the wide access to the two levels of carbonate Sarmatian rocks, as well as proximity – under 2 km in a straight line – to the site of Documaci. The genetic facies varieties are common on the horizontal scale, but knowledge of the basic types would permit early conclusions regarding the potential geological source formation for the stone used in the area of the burial mound.

Five thin sections were made from the total of 20 samples collected from this area during 2018: two from the Bessarabian rocks from the front of the stone quarry, and three from the Kersonian rocks corresponding to first and second steps of the quarry. Based on mineralogical-petrographic analyses with polarizing optical microscope, several varieties of limestone were highlighted, some being very similar to those identified from the blocks and fragments used in the masonry of the funerary at Documaci (Figure 163).

According to the modern textural classification (Hallsworth, Knox 1999: 10), including diagenetic processes and crystal-size qualifiers, the identified subtypes were: lime-pseudosparstone (main component = spherulitic calcite cement), lime-sparstone (>32 μm), lime-microsparstone (4-32 μm) and lime-microstone (<4 μm). Additionally, tanking into account the dominant type of allochems and the Romanian bibliography (Baltres *et al.* 2020), the varieties from the Limanu area were identified as:

Compact or friable limestone or calcarenites with small cardia fossils: biopelsparite, bio-sparstone (Figure 165/b, g, l). Bio-calcarenites (lumachellic limestone): micritic limestone with nubecularia and small gastropods (Figure 165/d, h). Biomicrite: micritic limestone with small cardia and mactra fossils and rhizolithes (Figure 165/f). Micritic limestone. Limestones and calcarenites: Pel-sparstone (Figure 165/e, j).

The degree of compactness of these types is variable. Rocks with high compactness were identified (especially micritic or light fossiliferous such as the limestones with nubecularia and gasteropods); medium compactness varieties (biomicrites, some biopelsarites), and medium to low compactness varieties (lumaschell limestones, where the percentage of fossils of cardia and oyster genus occupy more than half of the total mass of the rock, but their carbonate mould being either in small quantities or in sparse size) were also seen. The compactness is inversely proportional to the supposed porosity of the rocks, but there have been samples that proved to have a high resistance to cracking.

The colours of all these rocks vary from white to yellowish-white and white-brownish (Figure 165), which sometimes differ due to the degree of karstification (secondary calcitization) and the porosity induced by the presence of cardiacea and mactrashells. These surfaces were frequently covered with red-yellowish hydroxyl-iron from limonite groups, resulting from the leaching of these compounds from the regional soils and infiltration through the natural system of cracks. The rocks directly exposed to the reaction of water, wind and sun also suffered secondary phenomena of alveolation (enlargement/formation of big holes) and depositions of clay minerals by winds.

These field observations and laboratory analyses revealed that both Sarmatian levels which outcrop in the region contain varieties of rocks similar to, or equivalent with, those found within the Documaci mound. Additionally, the closeness to the historical site and the wider stretch of the Albești valley between Limanu and Mangalia are important in terms of recognising that the formations evolving in this area were optimally suited for exploitation and transport, with the minimum of effort, for use in masonry.

The Cotu Văii – Albești area

In the south-eastern extremity of southern Dobruja the most important watercourse is the Albești valley, the upstream part named Valea Mare, with Vîrtop near the homonym town. The karst properties of the crossed carbonate deposits and the small degree of consolidation of the loessoid formation that covered them allowed the valleys to carve into the valley, digging slopes as high as 50 m - 70 m.

On these slopes there are outcrops of horizontal stratiform deposits of Sarmatian age, with its two subdivisions: Bessarabian (smaller in scale, in the form of strips that fold after the watercourse) and Kersonian, much larger (Figure 167), which follows the entire

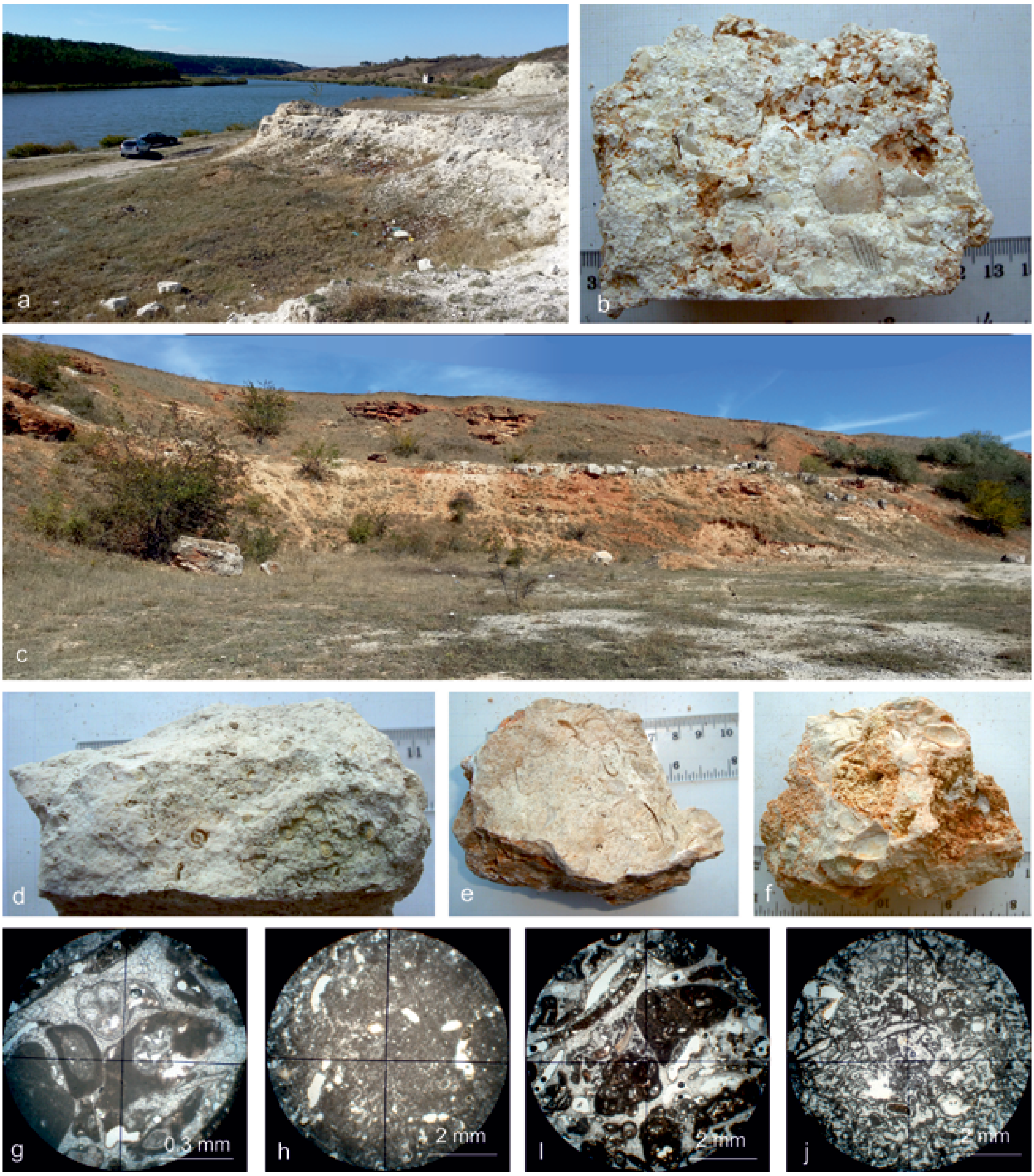


Figure 165. Limanu area: a, c) the quarry; b, d-j) analysed samples.

watercourse. These deposits appear in the scientific literature under the generic name of the Cotu Văii Formation.

Analysis of the geomorphological and geological maps generates an image of the relationship between the display of the outcrop areas (Figure 166/a-c) of the older deposits and the erosion processes on their more fragile cover, under the action of water. This can explain the hypothesis of the existence of a single lake, from which lakes Albești, Hagieni and Mangalia now exist, the latter adapted into a marine bay for economic reasons (Radan *et al.* 2013), that had spread over the entire currently visible area of the Kersonian deposits, similar to a major riverbed evolution, with a reduced slope of a river flow.

Although these outcrop areas are wide, the processes of rock transformation that were exposed to the exogenous factors (sun, water, air, temperature oscillations) limit

Figure 166. Albesti area: a, d, e) the Hellenistic Albești fort; b, c) prospecting along the Albesti Valley and surroundings; f-h) type of local limestones.

the possibility of clear visual identification of the different varieties of rocks. In addition to this, the biotic processes (pasture cover or various grasses), as well as the morphological absence of elements that would reveal potential spots for stone excavation.

The presence in the region of another important Hellenistic historical site, the fortress of Albești (Figure 166/d-e), has extended the necessary area of investigation to help identify the varieties of stone used in the construction of these buildings. The probability has been considered that these two historical sites associated with the Callatian area (Albești and the Documaci mound) may have had similar or close sources for the construction stone. The site catchment analyses have confirmed that throughout history the source for raw materials for construction were mostly brought from neighbouring areas, assuming that they met the minimum requirements regarding structural properties (durability, strength, workability) and the hoped for visual appearance.

Therefore, prospecting work was carried out along the Albești valley and identification done on the petrographic varieties used on the walls of the Albești fortress. As can be seen in the scientific literature, carbonate and sandstone formations were found, represented especially by white and yellowish to white-yellowish micritic, oolitic, and bioclastic limestones (light fossiliferous to lumachellic), but also unconsolidated sandstones and sands.

The samples collected from the Albești area were subjected to some initial petrographic analysis and in part to optical microscopic identifications. Samples were collected, and roughly described prior to more thorough analysis, and finds were made in each of micritic limestones, calcarenites and fossiliferous limestones (Figure 166/f-h). Although the varieties of limestone are referenced in the main literature, there were no significant similarities found with regard to the stones from the Documaci mound site. This implies either that there were no representative perimeters or outcrops identified (and which also met conditions regarding their massiveness required for shaping the blocks found inside the tomb), either rock types that contain present local facies variations, or the fact that the extraction points for the two historical sites were different.

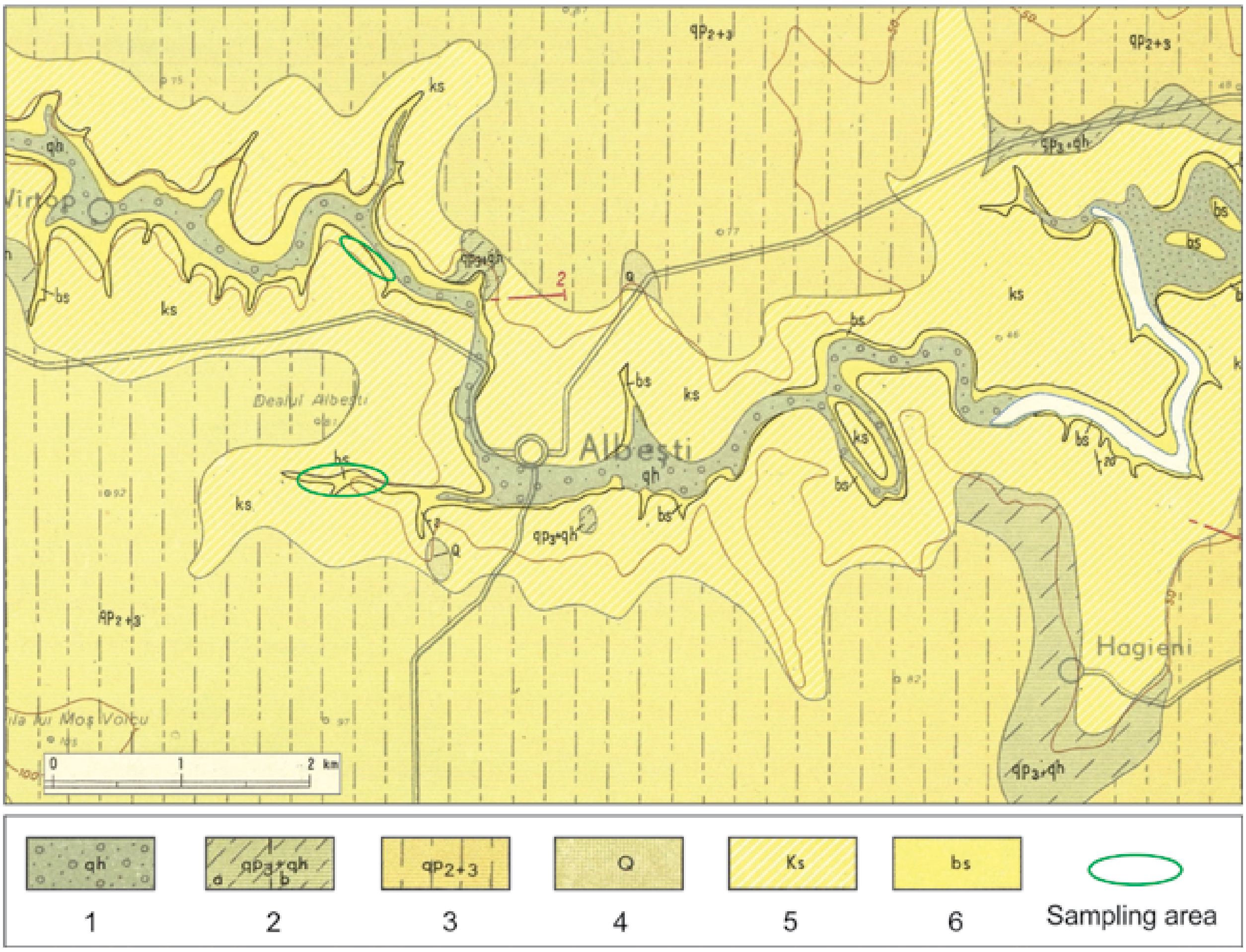


Figure 167. Geologic Map of the area. Legend: Holocen (current and sub-current alluvia); 2) Holocen/Upper Pleistocen (Loessoid (colluvial – alluvial) deposits: a: clayey silts; b: siltic clays); 3) Middle and Upper Pleistocen (Loesses - clayey silts); 4) Undivided Quaternary (Eluvial deposits – red clays); Sarmatian: 5) Kersonian (bioclastic limestones, oolithic limestones, calcarenites, sandstones, sand with Sarmatimactra bulgarica, S. Crassicolis, s. Caspia, Helix, diagenetic small gastropods, ostracods, rare foraminifers); 6) Bessarabian (Bioclastic limestones, oolithic limestones, calcarenites, algal limestones, sandstones, sands, sandy clays, bentonites with Cardium div. sp., Sarmatimactra ex. vitalina, Paphia, Dorsanum, Barbitella, Pirenella, ostracods, foraminifers).

Chapter 11

The Hellenistic Tomb under the Documaci Tumulus – a Cult Space During The Medieval Period

Oana Damian

The Hellenistic tomb with funerary chamber and *dromos* built of dressed blocks, discovered in the vicinity of Mangalia, under the Documaci mound, experienced, during the threshold of the 1st to 2nd millennium of the Common Era, a particular secondary utilisation. In the upper part of its plastered *dromos* walls, and, to a lesser extent, in the funerary chamber, a series of signs and representations were incised with a sharp instrument, at some time in a later phase, attesting anthropic activities which may be dated in the early Medieval period.[1]

The existence of this graffiti applied to a space of sacred significance following its initial funerary functionality, links, by analogy, the Hellenistic tomb at Mangalia (Documaci), together with the catacomb (comprised of a central chamber and two galleries) found in the tumuli necropolis of Istros,[2] to a phenomenon known, across the entire Pontus-Danube area, as the 'horizon of rock monastic complexes'.[3]

Cultural and chronological context

Identified through archaeological research in the southern area of historic Dobruja,[4] this horizon represents an homogenous milieu, made up of constructive manifestations of almost contemporaneous communities, both larger or smaller, sharing life conditions and artistic-religious expression. These manifestations imply a cultic significance given to certain spaces, either through secondary interventions to already built facilities (catacombs, *dromos* tombs) or, mainly, by carving rock churches, monk-cells, tombs, or galleries into natural chalk formations (i.e. the Murfatlar/Basarabi massif) or in limestone caves (typical for the southern historic Dobruja landscape).

This horizon (Figure 168) is represented by the monastic structures of Murfatlar/Basarabi (Barnea 1962; 1971: 180-233; 1981: 17-20, 46-91; 2003; Holubeanu 2006: 268-270, photos 1-4, pictures 6-7, 1 2, 14; Atanasov 2007: 188-194, 407, tab. XVI-XVII, L-LIII; Damian 2015: 109-118), Dumbrăveni (Chiriac 1988-1989; Chiriac, Papasima 2000; Holubeanu 2006: 249-251, 268–269, picture 2a; Atanasov 2007: 187, 407, tab. VIII.4, XXXIV.50, LIII.50a down; Atanasov 2011: 199-200, fig. 12-14, 203-204, 215, III.6; Damian 2015: 118-120), Suha Reka (Atanasov 1989: 54-55, tab. I/1-2, II/1-2, III/1-2; Atanasov 1991; Holubeanu 2006: 252-255, 268, 270, 272, map 3, pictures 3, 5, 8; Atanasov 2007: 109-118, 177, fig. 4, tab. V-VIII, XXXIV-XXXVI, XLIII; Atanasov 2011; Damian 2015: 120-121), Kanaghiol (Atanasov 1989: 54-55, tab. I/1-2, II/1-2, III/1-2; Atanasov 1991; Holubeanu 2006: 268, 271, 273-274, 277, map 4; Atanasov 2007: 186-188, 406-407, tab. XI-XV, XLIII, XLVIII-XLIX; Damian 2015: 121-123), around Kaliakra (Atanasov 1989: 57-61; Atanasov 1991; Holubeanu 2006: 251-253, 268, 274, pictures 4, 9; Atanasov 2007: 177, fig. 4; Damian 2015: 123-124), and around Varna (Atanasov 1989: 57-61; Atanasov 1991), to which we can add a series of monastic shelters, e.g. the Cernavodă quarries (Diaconu 1980a: 193; Papasima, Chera 1999: 294; Holubeanu 2006: 268, 277; Damian 2015: 107) and Aliman (Papasima, Georgescu 1994: 224, fn. 8; Papasima, Chera 1999: 289-291, 293, pl. II; Holubeanu 2006: 278, fn. 133; Damian 2015: 107), the caves at Casian and Cheia – 'la Izvor' (Chiriac 1988-1989: 264; Holubeanu 2006: 268, 270; Damian 2015: 107), as well as the subterranean labyrinth at Limanu.[5] This latter site merits special attention, being the closest to Documaci.

The defining elements of this phenomenon (the practice of arranging sites of worship and their annexes, the lack of a typical basilical plan, the presence of

[1] For the first mention of this graffiti in the context of the rescue archaeological project of 1993-1995, see Papasima, Georgescu 1994: 223-228, pl. I-III; see also Papasima, Chera 1999: 292 and fn. 15; Holubeanu 2006: 268, 276-277, 282, picture 15; Damian 2015, 107-108.

[2] For the tumulus XXVIII, see Alexandrescu 1966: 233-235; Papasima, Chera 1999: 292, fn. 16; Holubeanu 2006: 268, 277; Damian 2015: 107.

[3] Defined by Costel Chiriac (1988-1989: 254, 258-259, 264, 266, 268), the phenomenon will benefit from successive presentations looking specifically at historic Dobruja (Holubeanu 2006: 243, map 2, 249-256, 268-284; Atanasov 2007: 177, fig. 4, 186-201, 406-407, tab. V-XVIII, XXXIV-XXXVI, XLIII-LIII; Atanasov 2011: 199-200, fig. 12-14, 203-204, 215, pl. III.6; Damian 2015: 105 and fn. 196, 106-109, 124-131, 246-247, pl. XXXI).

[4] The unique archaeological site of Murfatlar/Basarabi, excavated in the Tibișir chalk massif, was discovered in 1957 and researched by Ion Barnea and his team (Barnea 1962; 1971: 180-233; 1981: 17-20, 46-91; 2003). This investigation in fact opened a series of discoveries of rock monastic complexes, made during the 1980-1990s in the area on both sides of the Romanian/Bulgarian border, especially in contributions by Costel Chiriac and Tudor Papasima (Chiriac 1988-1989; Chiriac, Papasima 2000; Papasima, Georgescu 1994; Papasima, Chera 1999), and the work of Georgi Atanasov and his collaborators (Atanasov 1989; 1991; 2007: 177, fig. 4, 186-201, 406-407, tab. V-VIII, XI-XV, XVIII, XXXIV-XXXVI, XLIII-XLIX; 2011).

[5] The Limanu cave (or underground shelter) contains chambers for living, access corridors and two chambers arranged as chapels (Boroneanț, Ciuceanu 1977: 52-53, 56, fig. 3-10; Papasima, Chera 1999: 291; Holubeanu 2006: 268, 275-276, pictures 10-11; Damian 2015: 107).

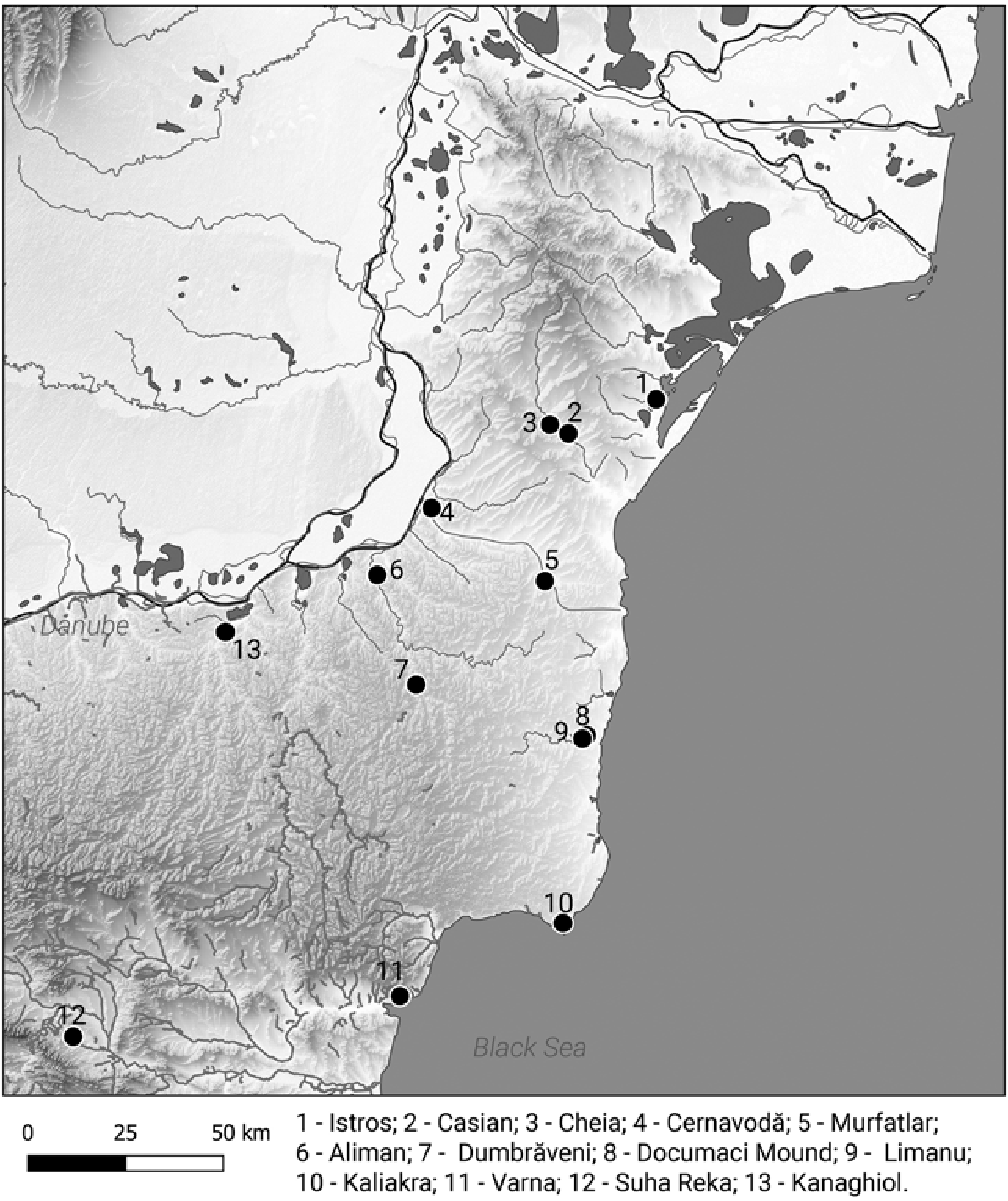


Figure 168. Monastic structures of the 9th-10th centuries AD in southern Dobruja.

chambers without a cultic role, e.g. hermitages, cells or household structures related to the organisation and functioning of monastic communities, the enhanced relationship with the funerary domain, the decoration of walls with a varied repertory of symbolic motifs, especially crosses, but also geometrical, zoomorphic, and anthropomorphic, with a religious or profane significance) were present (partially and variously) in each of the previously mentioned sites/micro-zones (Damian 2015: 108-109, 124-126). The decoration, including inscriptions – connected, most likely, to religious pilgrimage – remarkable and spectacular at Murfatlar, is present, even if in a lesser degree, in the rock colonies aligned along the dried river beds at Kanaghiol, and Suha Reka, or on the walls of the Aliman quarry, the Limanu hermitage, the Dumbrăveni and Kamen Briag complexes, and in Casian cave.

These monastic settlements, typical for the threshold of the 1st to 2nd millennium of the Common Era, with a special emphasis on the 10th century, have obvious roots, in terms of architectural-technical factors, in Late Antiquity, representing to a certain extent the achievements of Christian communities active in Roman-Byzantine times (4th-6th centuries), and then reused in the Middle Byzantine period (9th-11th centuries) and even later (Theodorescu 1974: 87, fn. 120; 1976: 120, 149, fn. 95; Diaconu 1977: 1899; Diaconu 1980b: 769; Chiriac 1988-1989: 264, 266, 268; Atanasov 1991: 43; Barnea 2003: 63; Holubeanu 2006: 249-256, 268-284; Atanasov 2011: 191; Damian 2015: 106, 127-128). The monastic colonies at Murfatlar and Karaghiol (in the vicinity of Silistra) emerge at the end of the 1st millennium (10th century, occasionally, when appropriate, extendable to the 9th-11th centuries), while those of Suha Reka and the vicinity of Varna and Kaliakra, even if established in the Roman-Byzantine period, were more intensively populated in the 12th-14th centuries (Atanasov 1989; 1991: 43; 2011: 189-190; Damian 2015: 107-108). In the case of the Murfatlar complex, the combined analyses of all the factors that tilt the chronological scale towards the 2nd half of the 10th century (Damian 2015: 109-110 and fn. 247-263) do not cancel out the archaic character of the monument (Damian 2015: 127 and fn. 469-473). The settlement of Dumbrăveni had two utilisation phases, i.e. the 4th-6th centuries and 9th-11th centuries (Chiriac, Papasima 2000: 223-227; Damian 2015: 108). Some elements gave indications for dating the mentioned sites to the 10th century in particular (Damian 2015: 108): the association between the ceramic finds and an exact date for some of the phases when the inscriptions were made, the almost identical monogram signs discovered at Dumbrăveni (Chiriac 1988-1989: 255; Atanasov 2007: tab. LIII.50a down), and in southern Dobruja (Atanasov 1989: 54-61, fig. 2, 4), the early Medieval pottery fragments discovered in the Casian and Limanu caves (Mihăilescu-Bîrliba, Diaconescu 1991: 430; Boroneanț, Ciuceanu 1977: 55-57, fig. 18-19), the analogies regarding the inscribed representations, i.e. the letters, crosses, monograms at Casian (Chiriac 1988-1989: 259, 264, fig. 5, A; Atanasov 2007: tab. LIII.50a up), Histria (Alexandrescu 1966: 235), and Documaci (Papasima, Georgescu 1994: 224; pl. III/2), and animal representations, i.e. at Aliman (Papasima, Chera 1999: 289-291, 293, pl. II) and Documaci (Papasima, Georgescu 1994: 224; pl. I/4-6, II/1-6).

The integration of the Documaci ensemble in this early medieval cultural horizon (Figure 168) is justified by the style and significance of the various figurative representations, carved on the walls of the Hellenistic funerary monument (Figures 169-174). The soft texture of the chalk walls at Murfatlar, on which a large number of inscriptions and representations were carved, is indeed spectacular, but the decoration is also observable, despite the relatively hard nature and irregular texture of the shell limestone, at the rock colonies along the dry riverbeds of Kanaghiol and Suha Reka, the cave shelters at Limanu and Casian, and the Aliman quarry.

The repertory of incised images and motifs at Documaci

The diverse signs and representations documented at Documaci, either during the initial research[6] (Figures 169/c-n; 170/c-j) or in the latest investigations[7] (Figures 169/a-b; 170/a-b; 171-174), are represented by the following motifs: bannermen – riding or on foot (Figures 170/b, d, e, j; 171/a-c); various animals[8] – goats, deer, a canid (wolf/dog), a boar, an unidentified decapitated animal (Figures 169/b, g-n; 170 /g; 172-173); sail boats (Figures 169/b-c; 170/c, f; 171/a-b, d), one carrying two individuals, but not well represented; drawings resembling monograms (Figure 169/b, d, f) – an almost rhomboid figure including a cross-like sign (Figure 169/e), and two pentagrams (Figure 170/h-i).

Incised representations belonging to the same categories observed at Documaci – geometric, anthropomorphic, and zoomorphic, some with strong and explicit magical-religious overtones (Diaconu 1980b: 769, fn. 10), common animals (horses, rabbits, dogs, deer, foxes, birds), hunting scenes (?), horses and riders, to which we can also add several rudimentary inscriptions – were documented in the monastic complexes of Murfatlar, Kanaghiol and Suha Reha, as well as the monastic refuges at Limanu, Casian and Aliman.

Cruciform motifs, similar to those present at Documaci – an almost rhombic figure including a cross-like sign (Papasima, Georgescu 1994: 224, pl. III/4) (Figure 169/e) were documented at Limanu,[9] in the area of the Black Sea (Holubeanu 2006: 252, picture 3), at Murfatlar (Barnea 1971: fig. 58-59, 63; 1981: 62-63, 68-69, 86-87, 91, pl. 17/2-3, 18, 20/2-3, 29/3, 31/2; Diaconu 1981: 377, fn. 19), Casian (Mihăilescu-Bîrliba, Diaconescu 1991: 429), Aliman,[10] Suha Reka (Atanasov 1989: obr. 4; 1990: 202-203, tab. VI-VIII), Alfatar (Atanasov 1989: obr. 2. g, d, e,

[6] We would like to thank Andra Samson for the digitisation of the drawings (Papasima, Georgescu 1994: 223-228, pl. I-III).
[7] H-RTI images recorded by Călin Șuteu, see Chapter 2.
[8] For the identification of the represented species of animals: Papasima, Georgescu 1994: 224, fn. 5.
[9] The representation on the wall of nine-point, human, animal, cruciform, and solar motifs (Boroneanț, Ciuceanu 1977: 51-56, especially 54, fig. 3-10; Papasima, Chera 1999: 291).
[10] Two crosses, a rider, horses, sickle-shaped objects (Papasima, Chera 1999: 289-291, 293, pl. II/7-8).

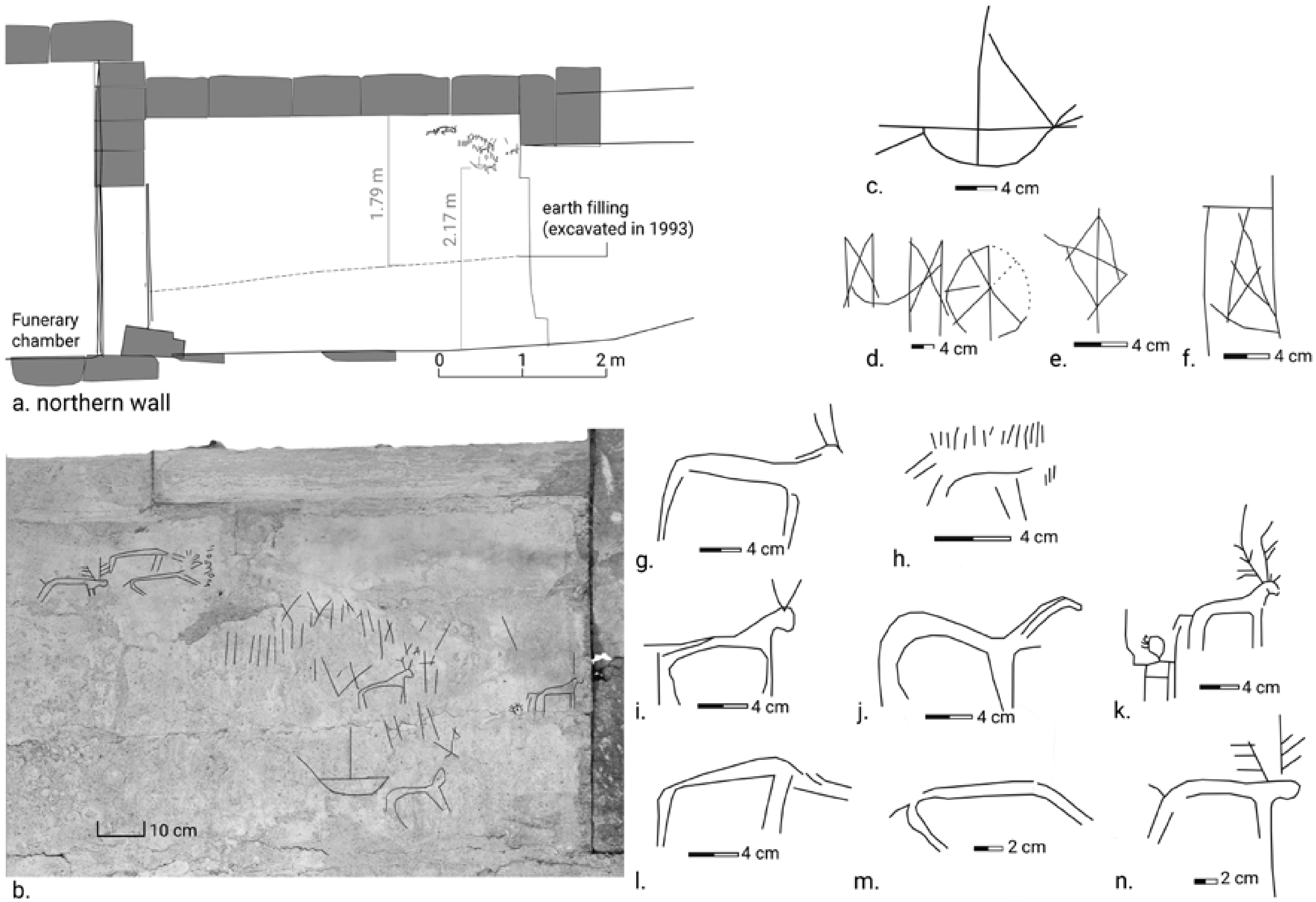


Figure 169. Incisions on the northern wall of *dromos I*: a) wall section; b) drawings over orthophotography as preserved in 2018; c-n) digitized drawings after Papasima, Georgescu 1994.

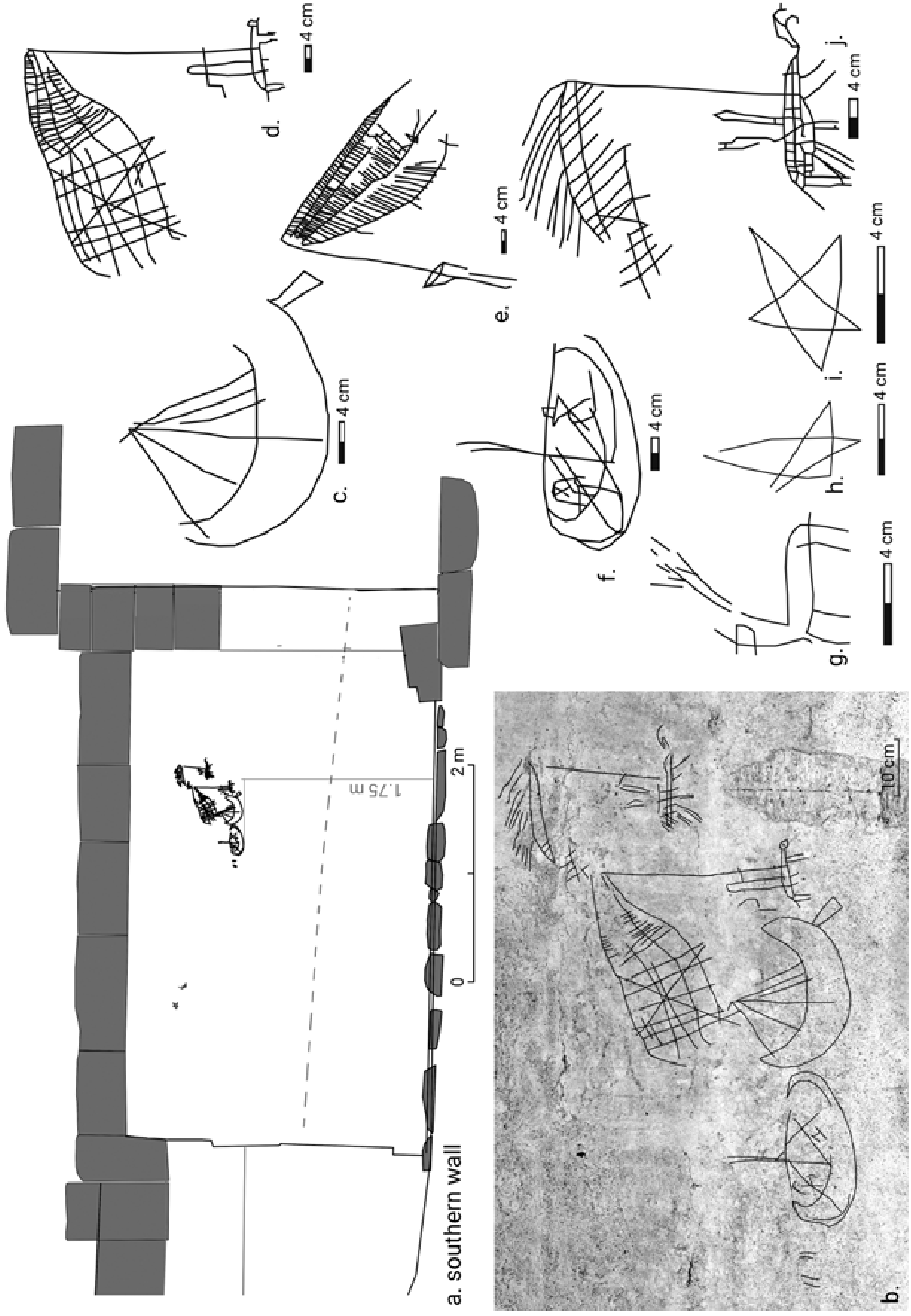


Figure 170. Incisions on the southern wall of *dromos I*: a) wall section; b) drawings over orthophotography as preserved in 2018; c-j) digitized drawings (after Papasima, Georgescu 1994).

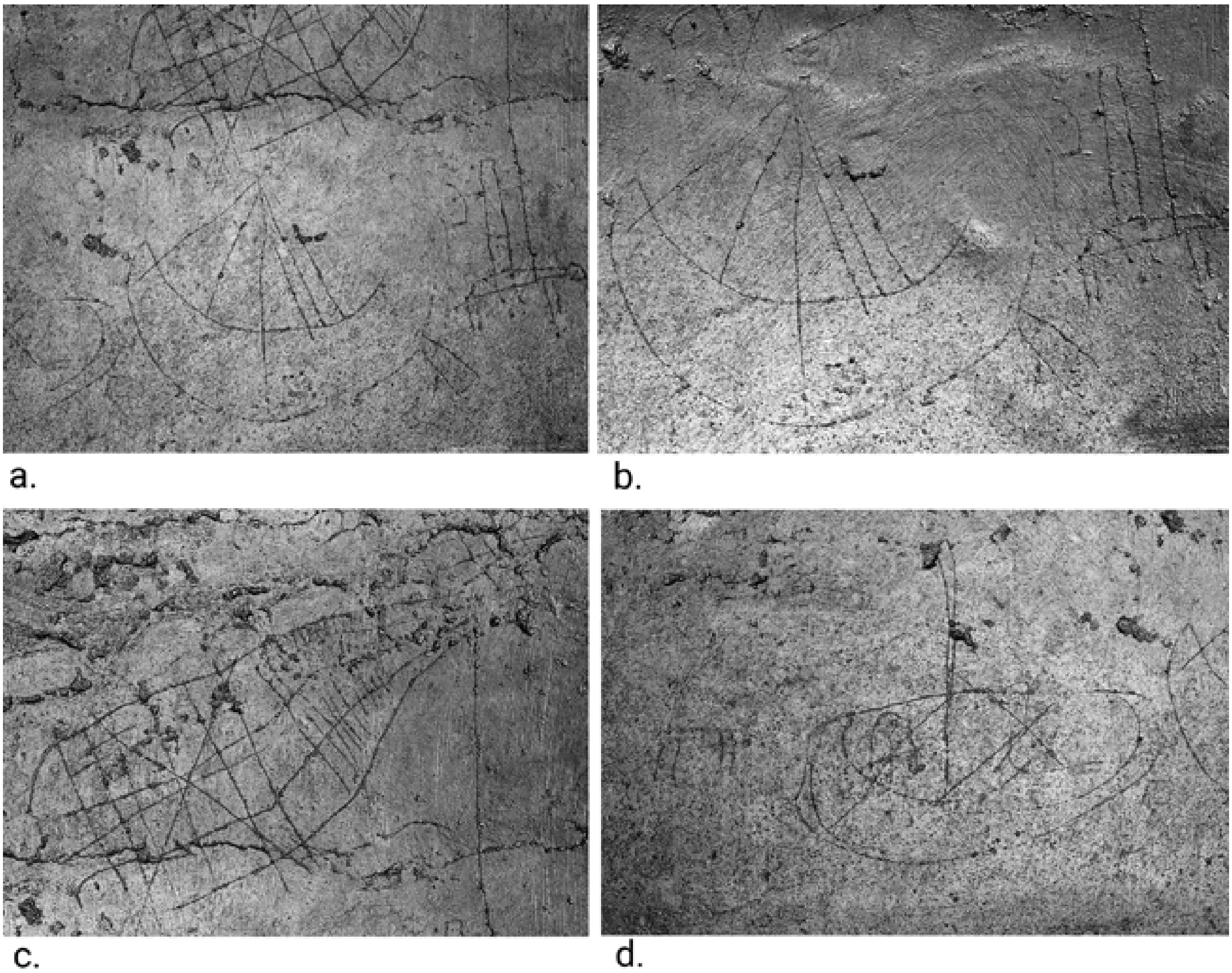


Figure 171. Images of ships (a, b, d) and bannermen (c) H-RTI panels (recorded by C. Șuteu).

j; 2007: tab. XV down left), Ruino (Atanasov 1991: tab. V.2), and Kanaghiol (Atanasov 2007: tab. XLVIII.106, 108, 123; XLIX.124).

Anthropomorphic motifs, similar to those from Documaci (Papasima, Georgescu 1994: pl. I/1, III/1) (Figures 169/b, k; 170/f; 172/b) were documented at Limanu (Boroneanţ, Ciuceanu 1977: 52, figs. 8-9) and Kanaghiol (Atanasov 2007: tab. XLVIII.108a, 123j; XLIX.124, 128); some representations, identified after recent investigations (Figures 172/b; 174), seem, due to what appears to be a halo, to represent a saint/orant, in the manner of the images found at Murfatlar (Barnea 1971: 205, fig. 74, 216, fig. 63; 1981: 66, pl. 19/1; 82, pl. 27/2), and Dristra – Kanaghiol (Atanasov 2007: tab. XLVIII.108a, 123j).

Analogies for the zoomorphic motifs at Documaci (Papasima, Georgescu 1994: 224, pl. I/4–6, II/1–6; Holubeanu 2006: 282, picture 15) (Figures 169/b, g-n; 170/g; 172-173) can be recognized at Limanu (Boroneanţ, Ciuceanu 1977: 51, fig. 5; Holubeanu 2006: 276, picture 11), Aliman (Papasima, Georgescu 1994, 224 and fn. 8; Papasima, Chera 1999: 289-291, 293, pl. II/2-4; Holubeanu 2006: 278, fn. 133) and Murfatlar (Barnea 1971: 187, fig. 46, 206-08, fig. 55-57; Theodorescu 1974: 88-89; 1976: 124; Diaconu 1980b: 767; Papasima, Chera 1999: 291, fn. 8). These animal images, especially the dogs and wolves, represent in fact, just a copy, and on a different chronological scale, of a tradition typical of the Late Roman world (Diaconu 1977: 1899; 1980b: 769).

The images of riders and *equidae* incised at Documaci (Papasima, Georgescu 1994: 224-225, pl. I/1-3) (Figures 170/b, d, e, g, j; 171/a-c) can be paralleled with those at Limanu (Boroneanţ, Ciuceanu 1977: 50-51, 53-54, fig. 3-4, 6; Holubeanu 2006: 276, picture 11), Aliman (Papasima, Chera 1999: 289-291, 293, pl. II/1), Murfatlar (Barnea 1971: 187, fig. 46, 206-208, fig. 55-57; Diaconu 1981: 377, fn. 21; 1995: 325),[11] Skala (Yotov, Atanasov 1998: 237, tab. XXXVIII.2; Atanasov 2007: tab. XLIII.97a), and Kanaghiol (Atanasov 2007: tab. XLVIII.123b; XLIX.123o).

[11] For representations of horses in relation to Steppe populations, see Barnea 2003: 90-91.

Representations of animals, especially of horses, dogs and stags,[12] may be correlated, although taking an important step in time,[13] with certain iconoclastic manifestations along the Lower Danube,[14] but also with a syncretic religious phenomenon bringing together early Christianity, the Pagan practices dating from the end of the Roman presence (Diaconu 1981: 377), and the rituals typical to allogenous populations of north-Pontus origin, belonging, in terms of dogma, to a community of believers only relatively subordinated to Constantinopolitan orthodoxy. The horse images merit, in the context just mentioned context, a distinct emphasis. These animals, well-known as psychopomps, may be related, when found in monastic contexts, to Saint Theodoros (Diaconu 1981: 377, fn. 21; 1995: 325).

In the same series of cultic elements that are characteristic of the provincial Roman world, and clues to a sustained cultural synthesis, can include: the animal representations (horses, dogs/wolfs), the images of riders/hunters, the square with inscribed diagonals, and the *fasciae* with axes (Diaconu 1980a: 194; 1989: 430-431; Damian 2015: 202). The images of horses and mounted warriors resonates, however, with echoes coming from the world of the Eurasian Steppes (Theodorescu 1974: 94, fn. 140; 1976: 125-126, fn. 110-111).

The motif of the sailing ship, seen at Documaci (Papasima, Georgescu 1994: 224, 226-227, pl. II/7-8, III/1) (Figures 169/b-c; 170/b-c, f; 171/a-b, d) has also been documented at Murfatlar (Barnea 1962: 193, fig. 12; 1981: 56, pl. 14/1; 86, pl. 29/2; 2003: 91, 96; Diaconu, Năsturel 1969: 446, fig. 2/1; Diaconu 1980b: 768-769), Alfatar (Atanasov 1989: fig. 2.d, e, j), Skala (Atanasov 1990: 201-202, tab. V.2, VI.5; 2007: tab. XI.1, XLIII.98a; Yotov, Atanasov 1998: 237, tab. XXXVIII.4), and Kanaghiol (Atanasov 2007: tab. XLIX.126a).

This type, frequent in pre-mediaeval northern European,[15] Sweden and Gotland, was considered as indicating a potential mingling of northern artistic influences (Theodorescu 1974: 88-89, 92-93; 1976: 124, fn. 104) with older, pre-Christian, local backgrounds (Theodorescu 1974: 94; 1976, 125; Diaconu 1980b: 767).

The ship motif could have reflected, equally, a local tradition, springing from Roman religious beliefs, such as those encompassed by images, found on funerary stones, of vessels crossing the Styx (Diaconu 1980b: 769, fn. 10).

The pentagram motif, illustrated in two examples at Documaci (Papasima, Georgescu 1994: 224, 227, pl. III/5-6) (Figure 170/h-i) is also recorded at Istros (Alexandrescu 1966: 235), Murfatlar (Barnea 1981: 52, pl. 12/3) and Skala (Yotov, Atanasov 1998: 237, tab. XXXVIII).

For the letters, small crosses and monogram signs inscribed on the plastered walls of Documaci (Papasima, Georgescu 1994: 224, pl. III/2-3; Papasima, Chera 1999: 292; Holubeanu 2006: 268, 276, 282, picture 15), including what seems an inscription (Figure 169/b; 173), analogies can be found at Istros,[16] in the Limanu shelter,[17] and in Casian cave.[18]

Any overview of the discussed representations should emphasize the close similarity between the equestrian images of Documaci (Papasima, Georgescu 1994: pl. II/1-4) and Aliman (Papasima, Chera 1999: pl. II/2-4), while for the ships and pentagrams (Papasima, Georgescu 1994: pl. II/7, III/4) analogies to help with identification can be sought at Kanaghiol (Atanasov 2007: tab. XLIX.126a). It could even be feasible to advance the hypothesis of a single author, explainable, eventually, from its itinerant character – a not so unlikely possibility considering that Kanaghiol seems to have been the headquarters of a monastic settlement, while Aliman and Documaci were, obviously, temporary shelters.

The significance of the discovery and the cultural horizon to which it belongs

Despite obvious variance in the categories of environment with which they can be paired - remote areas, away from the more popular communication routes at certain periods (e.g. the Danube Valley of the Black Sea shores), rocky landscapes requiring specific construction activities, inaccessible heights or subterranean spaces – all the discussed representations and shelters are just facets of the same phenomenon of social retreat fuelled by the primary desire for personal isolation.. The presence of monastic settlements in the

[12] For such representations at Murfatlar, see Barnea 1962: 193, fig. 9-11; 1971: 197-200, fig. 51, 56/2, 57; 1981: 50, 52-53, pl. 12, 13/2, 86-87, pl. 29/1.

[13] See also Theodorescu (1974: 91) for close ties between the growth of monastic life along the Lower Danube, with iconoclastic manifestations, despite no chronological correspondence.

[14] See references in this regard in *Cronica lui Mihail Moxa* (Damian 2015: 129, fn. 486).

[15] For the discussion concerning the association of the sailing ship motif with northern populations (Vikings), to a greater degree than with Byzantine traditions, and the absence of connections with Bulgarian contexts, see Diaconu 1980b: 768-769, fn. 6-10; Damian 2015: 203-204.

[16] The letter K (Alexandrescu 1966: 235).

[17] A Cyrillic inscription (Boroneanț, Ciuceanu 1977, 53-54, fig. 11-13; Holubeanu 2006: 275).

[18] The inscriptions seem to have been made on a surface prepared in three successive phases: [a)] the smallest letters grouped in two rows, [b)] [c]rosses and monograms; [c)] [t]he two very large letters KN (Chiriac 1988-1989: 259, 264, fig. 5, A; Mihăilescu-Bîrliba, Diaconescu 1991: 430, fig. 5), and, directly on the vertical wall, with no prior preparation, another inscription was inscribed, from which only the letters II, N and eventually B can be deciphered (Mihăilescu-Bîrliba, Diaconescu 1991: 430, fig. 6). See also Atanasov 2007: tab. LIII.50a up.

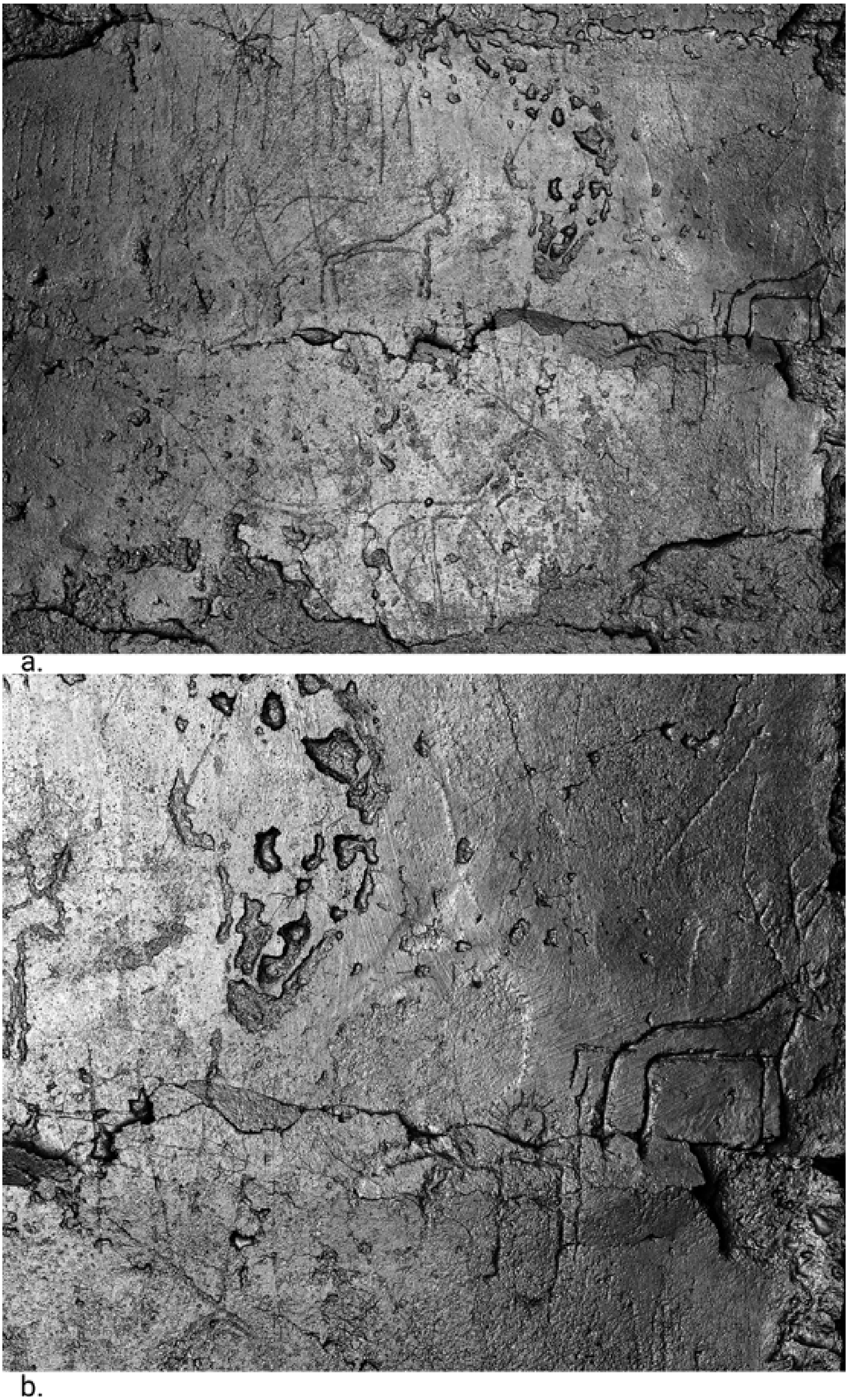


Figure 172. Northern wall of *dromos I*, H-RTI panels (recorded by C. Şuteu): a) incised stags; b) a human with aura/orant (?).

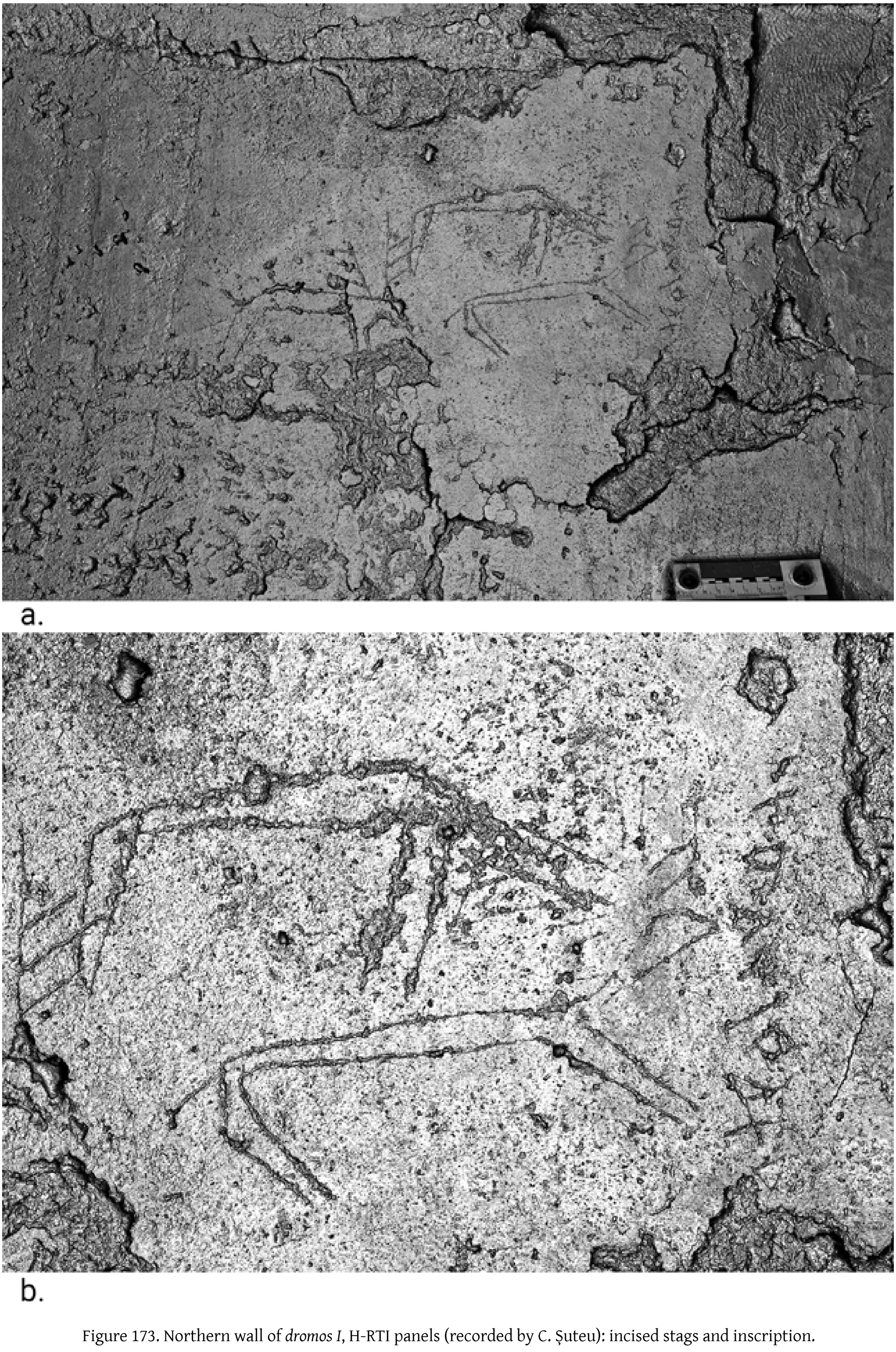


Figure 173. Northern wall of *dromos I*, H-RTI panels (recorded by C. Şuteu): incised stags and inscription.

a.

b.

Figure 174. Western wall of the funerary chamber, H-RTI panel (recorded by C. Șuteu): a human with aura (?).

Dobruja area fits this pattern at the time, manifesting itself after the model of Asia Minor communities in Crimea, Georgia, and southern Italy (Theodorescu 1974: 91-92, footnote 133; 1976: 125-126, notes 107-109), by monastic groups or hermits retreating into the wilderness, within the context of a troubled social-political environment and missionary activities in the vicinity of borders in the wider region (Theodorescu 1976: 125-127; Damian 2015: 129-131).

The two manifestations characterized by a preference for small spaces for retreat, with the pre-existing sacred/cultic connotation of the Documaci mound and Istros Tumulus XXVIII, seem more related to the hermitage phenomenon.[19] The various representations of the graffiti types (or even inscriptions) sustain the hypothesis that the sites could have been used as temporary refuges/resting places on a pilgrimage (Holubeanu 2006: 283; Kostova 2011: 203; Damian 2015: 126) within the relative protection of fortified borders.[20] On a larger scale, this monastic phenomenon can be interpreted as an important factor in the spreading of Christianity in Bulgarian lands,[21] within the context of continuing relations with the Byzantines and a sort of osmosis of the various elements of spiritual traditions in the Lower Danube (Diaconu 1980b: 770; Damian 2015: 128). The assumption of population continuity, preserving a paleo-Byzantine tradition in these Dobruja monuments of the mid Byzantine period, cannot be denied, nor the composite character of the monastic population, coming from different cultural backgrounds (Papasima, Chera 1999: 292). The latter might explain the variety of depictions on the walls, signifying the contribution of a varied milieu of ancient local beliefs (post Roman), or specific to allogenous people (Slavs, Bulgarians) associated with ideas of oriental dualism (Paulician), which might have imprinted a heterodox orientation on local Christian life (Diaconu 1989: 430-431; Zugravu 1997: 458, 471-472).

These monastic elements mentioned may be defined, even under the regulations imposed on various anchoritic manifestations, as a particular aspect of popular Christianity along the cultural corridor of the Lower Danube, a Byzantine-Balkan phenomenon of common monasticism, characterized by certain initiatory practices, defined through a religious syncretism – mixing elements of archaic cults with dualist beliefs of Paulician influence and Byzantine orthodoxy (Theodorescu 1976: 126-127; Diaconu 1981: 377; 1989: 430-431; Chiriac 1988-1989: 26; Zugravu 1997: 455, 458-459; Holubeanu 2006: 280; Damian 2015: 129-130). Concerning the representations discussed above, they seem to be part of an horizon of ’folk handicraft’, made available to a monastic community, where, alongside the signs and symbols of the oriental Steppes, the Viking north, Dobruja, and Balkan pre-Christian traditions, some heterodox traditions also found their place (Theodorescu 1976: 126-127).

[19] See, in this sense, the opinion of Ionuț Holubeanu (2006: 276-277, and fn. 125) according to whom certain preparations related to the re-use of the Hellenistic tomb in medieval times (a rectangular tower-annex filled with stones; Papasima, Georgescu 1994: 224) may be associated with the idea of the phenomenon of ‘stylites/pillar saints’ (those hermits living in isolation from the world on pillar/column tops (gr. *stylos*), in a confined, roofless space).

[20] See Curta 1999: 148-149. See also Damian (2015: 58, 62, 202) for the association of the linear fortification that crosses the centre of Dobruja, known as the ‘stone *vallum*’, having a border role, and the monastic communities organizing work in the quarries for its construction,.

[21] For connections with the period of Bulgarian Christianisation and a Byzantine return to the area of the Lower Danube, see Zugravu 1997: 455, 457; Kostova 2011: 207; Damian 2015: 108.

Chapter 12
Catalogue of Ceramic Finds

Livia Buzoianu

The catalogue of ceramic finds describes only the artefacts discovered in the last years' excavations (2017-2019).[1] The majority of the recently made finds can be dated during the Hellenistic period, while about a third belongs to the Late Roman era (5th-6th c. AD). The analysed items were in a fragmentary state, hampering the identification of their typology and, respectively, the determination of a more precise chronology. The fragments belong to common vessel types, occurring in the following order: fish-plates, bowls (including plates), amphorae, lids, *lekanides*, other Hellenistic vessels (one item in each of the categories *kantharoi*, *askoi* and *unguentaria*). The catalogue contains also references to building materials (tiles, imbrices), fragments of Roman amphorae with various decorations, and fragments of Roman pottery of common use.

The closest analogies for the Hellenistic pottery in the Documaci mound may be recognized in the Callatian necropoleis, especially in the tomb under a mound near the village of 2 Mai (Preda 1962), and in other neighbouring Pontic colonies. The chronological framework for the bulk of these finds is end of the 4th - first half of the 3rd c. BC. The only items which allow a tighter chronology are two fragments of Sinopean amphorae, bearing stamps (only one clearly readable), belonging to the end of the 3rd - first decades of the 2nd c. BC (*c.* 216-185 BC) or only at the end of the 3rd c. BC (216-203 BC).

A. Amphorae (Catalogue A 1-13)

The preserved items were fragmentary. The available shapes and the quality of fabrics supported the identification of their production centres as: Heraclea Pontica, Thasos, Sinope and Tauric Chersonesos. Their fragmentary preservation state did not allow the establishing of a strict typology with chronological significance. The common time framework for the analysed fragments is the end of 4th - 3rd c. BC (with limitations to the end of the first quarter of the 3rd c. BC in the case of Heraclea Pontica, middle of the 3rd c. BC for Thasos, and second half of the 3rd c. BC for Sinope and Chersonesos).

Only two amphorae stamps were found, both from Sinope, with only one allowing a more certain reconstruction of its legend. The astynom Αἰσχρίων Ἀρτεμιδώρου, previously recorded at Callatis with one specimen (Conovici *et al.* 1989: 122, cat. 194), belongs to sub-group VI D (about 216-203 BC), situated towards the group's end. The second stamp has only a few readable letters, and even those with difficulty ΛΕΙ (?). Any restitution (for example, Πλεισταρχίδης Ἀπημάντου, Δεῖος, Κλεινίας Ἑκαταίου) remains uncertain. Amongst the possible names, the only one previously attested at Callatis is Πλεισταρχίδης Ἀπημάντου of the VI C 2 sub-group; the other two, from the last sub-group (VI E, *c.* 202-185 BC), have not been attested, even if relations between Sinope and Callatis existed until the end of the amphorae stamping period.

A 1. Amphora – Dromos II sector; Z5-construction level. Find list P42. 2019 (Figure 175).
The inferior part and the foot of a Chersonesos amphora (probably a fractionary vessel); conical shape; tronconic foot, rounded, with a depression in the base; yellow-pink clay on the exterior (typical for Chersonesos); traces of a black substance (organic) deposited on the inside. The shape corresponds to amphorae of type I Б (Monachov 1989: pl. IV-XI) dated between the end of the 4th - end of the 3rd c. BC (possibly even to the beginning of the 2nd c. BC). We incline to consider the item from Documaci as dated between the last quarter of the 4th - mid 3rd c. BC, similar to finds from north-Pontic complexes (Monachov 1999: 428-429, pl. 186, p. 477-484, pl. 206).
Discovery context: S 1, square 8; absolute elevation 45.46 m; in the stone and earth back filling of the southern wall of *dromos* II, at the base of support wall Z5; associated with the building of the embankment monticules raised at the same time as *dromos* II (its southern wall).
Dimensions: preserved height = 0.120 m; diam. preserved = 0.085 m; foot base diam. preserved = 0.051 m; wall width = 0.015 m.
Date: generally, between the end of 4th - mid 3rd c. BC.

[1] Editors' note: The majority of Hellenistic finds originates from only three pottery agglomerations (C5A, C5B and C6) researched (June 2019) in the north-western sector of the mound, in the same area where the *krepis* was designed to have 'an opening' in the vicinity of the ancient road, in the opposite direction to the tomb's entrance. These were agglomerations of vessels for serving food and liquids, some entire, others fragmented (see Figs. 44-46). They were very probably the remains of meal offerings left at the grave, made on the original vegetal layer, during the burial or/and at some subsequent commemorative celebration. Fragments of animal bones, burnt and unburnt, were found under (mostly) and above the vessels – see Chapter 14. They were covered in a soil deposit containing amphorae fragments. Due to their very recent discovery, to meet the deadline for the current publication only a selection of the abundant of material, mostly fragmentary, could be included in this catalogue. A more detailed publication, following a process of restoration, is expected to follow.

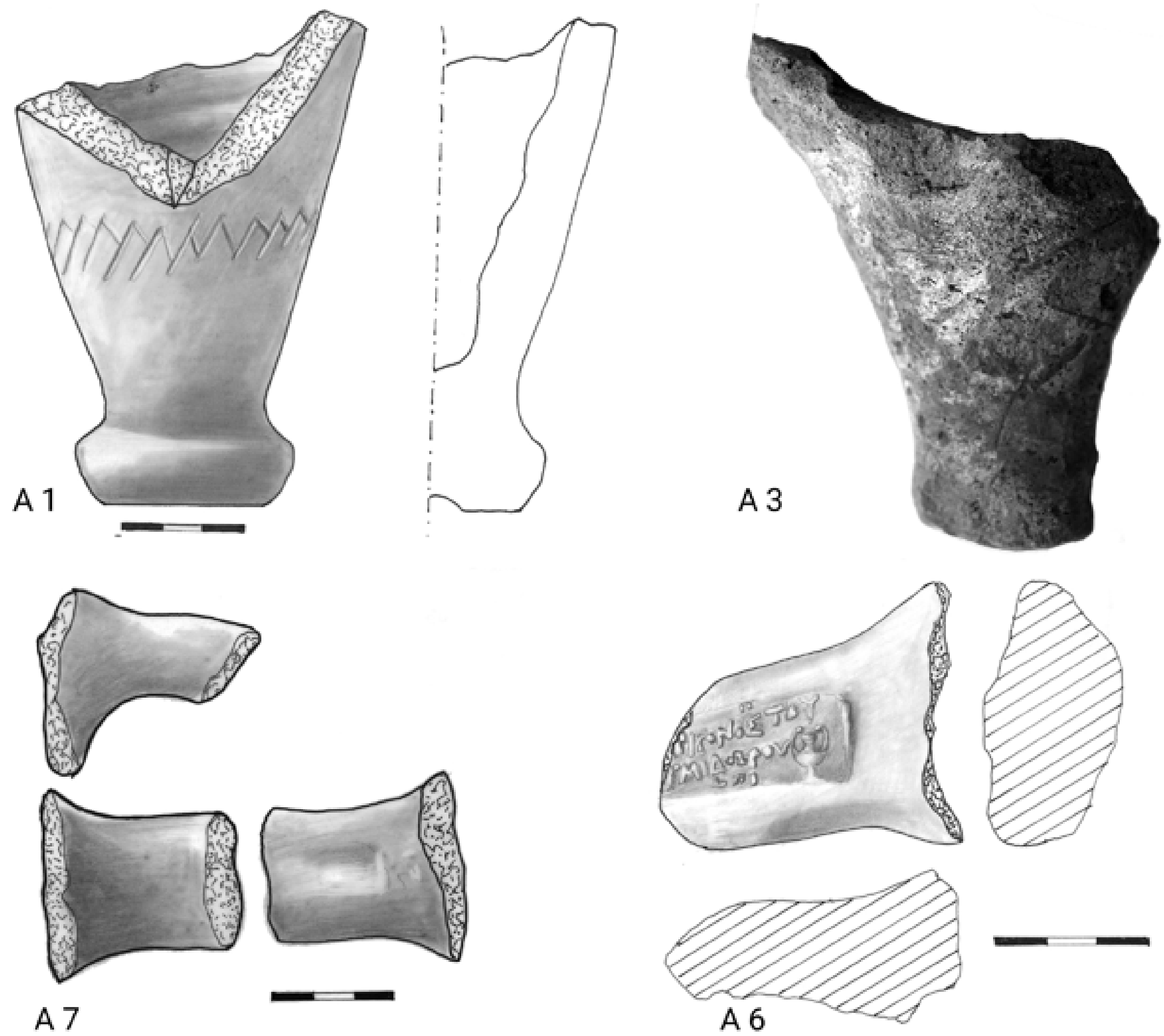


Figure 175. Amphorae found at Documaci (drawings by Fl. Marțiș).

A 2. Amphora – Dromos II sector; Z6 top stone covering. Find list P3. 2017. Not illustrated.
Fragments of amphora walls; few; pink-yellow fabric with light-coloured slip on the exterior (typical for Chersonesos); traces of secondary burning on the exterior.
Discovery context: S1, square 6; in the southern margin of the stone pavement topping the support wall Z6; associated with the building of the embankment monticules – raised at the same time as *dromos* II (its northern wall).
Date: generally, between the end of 4th - second half of 3rd c. BC.

A 3. Amphora – Dismantled dromos II sector. Find list P41. 2019 (Figure 175).
Foot and wall fragments; Sinope; one of the fragments has traces of the handle grip. The foot fragment belongs to the type with conical body and cylindrical foot, rounded at the end. The shape is common in the 3rd c. BC; possibly type II-B or II-C at Monachov (2003: pl. 102, 150-151) – datable of 4th - second half of 3rd c. BC.
Discovery context: S8, Square 2; absolute elevation 44.75-44.55 m: a layer of destruction with mixed materials, predominantly Late Roman, in the area where the easternmost sector of *dromos* II was completely dismantled.
Date: generally, between end of 4th - second half of 3rd c. BC.

A 4. Amphora – Dismantled dromos II sector. Find list P41. 2019. Not illustrated.
Amphora foot; Thasos (?).
Discovery context: S8, Square 2; absolute elevation 44.75-44.55 m: a layer of destruction with mixed materials, predominantly Late Roman, in the area where the easternmost sector of *dromos* II was completely dismantled.
Date: generally, between end of 4th - mid 3rd c. BC.

A 5. Amphora – Krepis gate; under Z2-debris. Find list P12. 2018. Not illustrated.
Rim of Heraclea Pontica; small fragment of wall (probably from the same vessel).
Discovery context: S7, Square 3, absolute elevation 45.02 m; on the exterior of Z2, underneath its debris; in the open space of the *krepis*, in the north-west sector of the mound, where, generally, ritual deposits containing the remains of food offerings were found.

Date: generally, between end of 4th - end of first quarter of 3rd c. BC.

A 6. Stamped amphora – Dromos II *sector; recently altered deposit. Find list P1. 2018 (Figure 175).*

[ἀστυνομοῦ]ν[τος]	
[Αἰσχ]ρίωνος τοῦ	
[Ἀρτ]εμιδώρου	kantharos
[..........]Η[........]	

Discovery context: S1, square 7, immediately to the south of the metallic post which supported the modern door blocking the *dromos* entrance in 1994; absolute elevation 45.65 m; in a filling already disturbed during the 1993 excavations. Could have come from anywhere.
Stamp *Dimensions*: 0.035 m x 0.017 m.
Sinope; Astynom, sub-group VI D (Garlan 2004). Name attested at Istros (Conovici 1998: cat. 568-569); Tomis (Buzoianu 1981:147, nr. 53); Callatis (Conovici *et al.* 1989: 122, cat. 194); Costinești (Gramatopol, Poenaru Bordea 1969: cat. 1126, 1127).
Date: *c.* 216-203 BC.

A 7. Stamped amphora – Western sector; Z3/altar-collapse debris. Find list P1. 2017 (Figure 175).

[ἀστυνόμου]		[ἀστυνόμου]
[.]ΛΕΙ[..........]	e.g.	[Κ]λει[νίου τοῦ]
[....................]		[Ἑκαταίου]
[....................]		[....................]

Sinope; Restitution example after Pridik 1917: 73, no. 227.
Discovery context: S2, Square 5; 25 cm beneath the soil surface; absolute elevation 45.00 m near the southern margin of Z3 (the rectangular stone platform adjoined to the *krepis* on its western side); the structure was exposed for a while, near an ancient road; its southern side collapsed in the neighbouring ditch in a subsequent period.
Stamp *Dimensions*: 0.026 m x 0.016 m.
Date: either 230-217 BC (sub-group VI C 2) or 202-185 BC (sub-group VI E).

A 8. Amphora – Above and around C5B. Find list P50. 2019 (Figure 176).
Sinopean foot, fragment; disk-shape with a depression in the bottom. According to shape it belongs to the pithoid type (II-A-1, II-E at Monachov 2003: pl. 101/4-5, 102/6-7, 103/2); it does not exceed the limits of the 4th c. BC (Monachov 2003: 158-159). The closest is an item dated in the third quarter of the 4th c. BC (Monachov 2003: pl. 103/4, type II-E-2).
Discovery context: north-west sector, *krepis* 'gate', S10, sq. 2-3, absolute elevation 45.00 m - 45.12 m; above and around C5B.
Date: third quarter of 4th c. BC.

A 9. Amphora – Above and around C5B. Find list P50. 2019 (Figure 176).
Fragment of neck with handle of a Rhodian amphora; the neck has cylindrical profile, the lip is slightly rolled to exterior, the handle has circular section and slight arching in the upper part. It belongs to the types known to have stamps (I and II at Finkielsztejn 2001) from the second quarter - end of 3rd c. BC. The triangular section of the lip and the arching handle places the item closer to Finkielsztejn 2001: pl. a/7 and pl. B/8, specimens dated *c.* 270-246 BC. At Monachov (2003: 122, pl. 79/6, 80/3-4) it can be recognized in types I-B and II-D, dated second quarter - mid 3rd c. BC.
Discovery context: north-west sector, *krepis* 'gate', S10, sq. 2-3, absolute elevation 45.00 m - 45.12 m; above and around C5B.
Date: second quarter - mid 3rd c. BC.

A 10. Amphora - Above and around C5B. Find list P50. 2019 (Figure 176).
Fragment of amphora neck with handle; relatively short handle with cylindrical section; beige fabric, compact; its surface is covered by limestone deposits. It could be a Sinopean product, type II-E-3 (Monachov 2003: pl. 103/3-4) dated last quarter of 4th - beginning of 3rd c. BC (the handle section is however here ellipsoidal). The fabric quality may be also related to Rhodian specimens with short neck, type II, dated first third of 3rd c. BC (Monachov 2003: 122 and pl. 85).
Discovery context: north-west sector, *krepis* 'gate', S10, sq. 2-3, absolute elevation 45.00 m- 45.12 m; above and around C5B.
Dimensions: handle height = 0.14 m; handle diam. = 0.04 m.
Date: last quarter of 4th - beginning of 3rd c. BC.

A. 11. Amphora – Above and around C5B. Find list P52. 2019 (Figure 176).
Discovery context: north-west sector, *krepis* 'gate', S10, sq. 2-3, absolute elevation 45.00 m - 45.12 m; above and around C5B.
See discussion at A 13 for chronology.

A 12. Amphora – Above and around C5B. Find list P52. 2019 (Figure 176).
Fragment of Sinope amphora neck with handle; neck with profile slightly swollen; rolled rim to exterior;

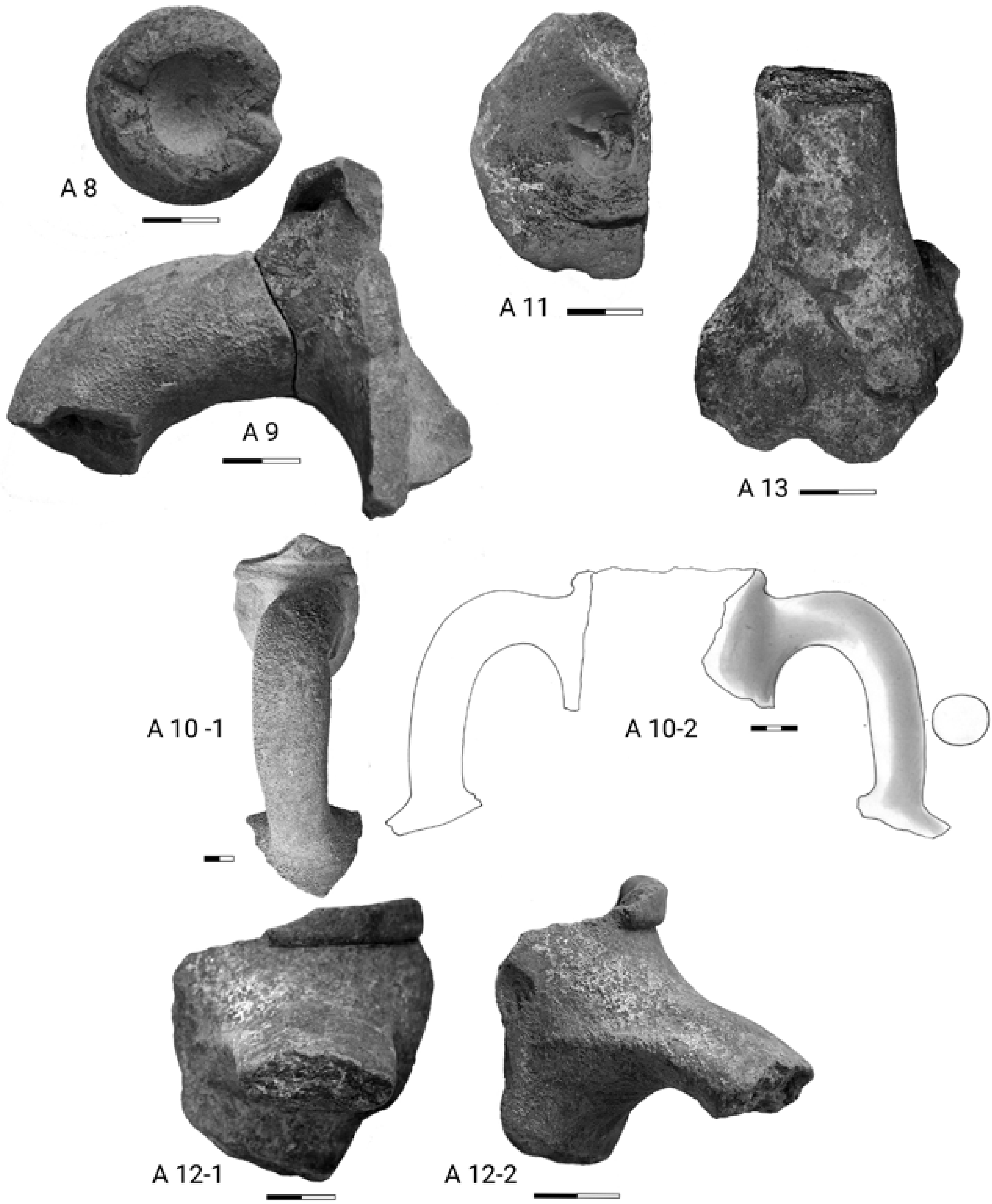


Figure 176. Amphorae found at Documaci (A 8-A 13) (photos by D. Ștefan, drawings by Fl. Marțiș).

broad handle with ellipsoidal section; taking into consideration the neck profile it could be type II-E-3 (Monachov 2003: pl.103/3) – last quarter of 4th - beginning of 3rd c. BC, or type III-C (Monachov 2003: pl. 104/1) – second half of 3rd c. BC.
Discovery context: North-west sector, *krepis* '*gate*', S10, sq. 2-3, absolute elevation 45.00 m -45.12 m; above and around C5B.
Dimensions: height = 0.075 m; diam. = 0.075 m.
Date: generally 3rd c. BC.

A 13. Amphora - Under C5B; original vegetal layer. Find list P111. 2019 (Figure 176).
Fragment of an amphora handle; ellipsoidal section; alveoli at the base of the handle. Intensely brick-coloured fabric with black particles and mica. The

fragment belongs to an early specimen of the 4th c. BC (considering the alveoli at the base), difficult to assign: Peparethus I, Akanthos, Ikos or a product of one of the north-Aegean centres around Thasos. At Callatis all these were already attested (Buzoianu 1999: 204-205 and pl. III/3; 2016: 259-260, 262): middle to 3rd quarter of the 4th c. BC for Peparethus, beginning of the 3rd c. BC or even end of 4th c. BC for Ikos, 315-295 BC for Akanthos. Despite difficulties, we may attempt an analogy with the specimen from Ikos known at Callatis – the common features being the ellipsoidal section of the handles, the alveoli at the base and the colour and texture of the fabric (Buzoianu 1998: 79, cat. 159, pl. VIII; Doulgeri-Intezessiloglou, Garlan 1990: 373, fig. 7). The same fabric characteristics were observed for A 11 (see analogies at Garlan, Doulgeri-Intzesiloglou 1990: 375, Figure 19-20).
Discovery context: north-west sector, *krepis* 'gate', S10, sq. 3, absolute elevation 44.60 m- 44.70 m; under C5B; in the upper part of what is believed to have been the original vegetal layer at the time of the tumulus construction.
Dimensions: preserved height = 0.10 m; handle diam. = 0.035/0.02 m.
Date: second half of the 4th c. BC - beginning of the 3rd c. BC.

B. Fish-plates (B 1-18)

Fish-plates (*plats-à-poissons*) are the most consistently represented category of discovered ceramic vessels in the Documaci mound: 14 fragments were catalogued while others were presented collectively. It is possible that among the 14 fragments, some belong to the same vessel. After the number of alveoli (cups), the number of entire specimens must have been at least six. All the fragments belong to the type with horizontal floor, downturned rim, bent at a right angle towards the exterior, and central depression. On the margin of the floor, close to the junction with the rim and around the central depression, grooves were incised. We cannot estimate the height of the vessels; in several cases we notice, however, a relatively high foot (cat. B 5, 7) with a projecting base (cat. B 10). The fabric varies from beige-yellowish, consistent structure (cat. B 3, 6, 8, 9, 11), to beige with sandy particles and fine mica (cat. B 2, 4, 12), or coloured as intensely red brick, with ingredients similar to those of Sinope products (cat. B 5, 10). The majority of the vessels are covered in brown lustreless glaze; in three cases (cat. B 4, 8, 12) the interior surface of the vessel was covered in red paint. Several fragments (cat. B 5, 8, 13, 14) have striations on the dorsal (cat. B 13) and interior sides from the potter's wheel; two fragments (cat. B 1, 3) have traces of secondary burning. The approximated diameters come close to the values 0.22 - 0.23 m (the largest fragment cat. B 3 has a diameter of *c.* 0.22 m). Other fragments measure 0.18 m - 0.185 m, or 0.165 m in diameter.

Similar shapes were documented by Rotroff (1997) and dated end of the 4th - first half of 3rd c. BC.[2] Other specimens were assigned at Durankulak to end of 4th - early 3rd c. BC (Burow 1997: pl. 104/a), Apollonia Pontica – Kalfata from 315-280 BC (Damyanov 2017: fig. 9/4-6; 10/1-2; 11/1; 12/1-2), Sboryanovo, in the first half of 3rd c. BC (Chichikova, Dimitrov 1997: pl. 97/c, cat. 9, pl. 99/a, b, cat. 6, pl. 132). At Istros they are dated from the last quarter of 4th c. BC (Coja, Gheorghiță 1983: 52, no. 65; Alexandrescu 1966: 178, TII/3, pl. 90; 182, T. XXXIII/1, pl. 91; Bucovală 1967) to first quarter of 2nd c. BC (Alexandrescu 1966: 191, T. XXVI/13, pl. 93). One specimen, on the basis of two Rhodian stamps, among which one belonged to the eponym Δαμοκλῆς II, period III c, was dated *c.* 176-174 BC (see Finkielsztejn 2001: 192). The most recent item from Istros is a specimen found together with West-Slope[3] pottery, dated 125-86 BC (Alexandrescu 1966: 193, T. XXXVII/1). The closest shapes seem to be those dated around the mid 3rd c. BC. We can note two specimens from Istros (Alexandrescu 1966: 187, T. XXXIV/6, 12, pl. 92),[4] dated initially towards the end of the 4th - beginning of 3rd c. BC, that have been reanalysed and placed c. mid 3rd c. BC (Alexandrescu 1978: cat. 609-610). A similar example comes from Callatis (Bârlădeanu-Zavatin 1980: 231, pl. VII/1) dated with some probability to first half of 3rd c. BC. From the Istrian territory, at Corbu de Sus, there comes another vessel, in grey fabric, also dated towards the mid 3rd c. BC (Irimia 1980: 92, pl. 2/2; 8/7). The examples from Albești, in Callatian territory, were dated again towards the middle and third quarter of the 3rd c. BC (Buzoianu, Bărbulescu 2008: 198 and cat. C C 155 - found in the same context as a Sinopean stamp of the period VI B).

B 1. Fish-plate – Pottery agglomeration C5B. Find list P87-2019 (Figure 178).
Four fragments of vessel body; circular groove on the floor margin; fabric brick-coloured; brown paint on the dorsal side; traces of secondary burning.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.185 m; rim height= 0.021 m.

[2] Rotroff 1997: cat. 710 (325-310 BC), cat. 711-715 (310-290 BC) and cat. 716-719 (290-250 BC).
[3] For 'West-Slope' vessels, see Lungu 2013: cat. Aa2 (Alexandrescu 1966: 95-96, T. XXXVII), Ap. 1 Alexandrescu 1966: 95-96, T. XXXVII/7), both dated 100-86 BC, and BCs5 (Alexandrescu 1966: pl. 79, 95, T. XXXVII/4), dated 125-100 BC.
[4] In T. XXXIV there was also another specimen (Alexandrescu 1966: 187, pl. T. XXXIV/17), which, taking into consideration its description, belongs to the same type. All the fish-plate finds in this tumulus were Attic.

B 2. Fish-plate – Agglomeration C5B. 2019 (Figure 178).
Two fragments of the same vessel; groove on the margin and on the exterior; beige fabric with mica; traces of brown paint.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.18 m; rim height = 0.02 m.

B 3. Fish-plate – Pottery agglomeration C5B. Find list P52. 2019 (Figure 178).
Several fragments of the same vessel; yellow fabric, dense; striations on the surface; brown lustreless glaze on the exterior in a thin layer; traces of secondary burning.
Discovery context: North-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m-45.00 m
Dimensions: diam. *c.* = 0.22 m; rim height = 0.02 m.

B 4. Fish-plate – Pottery agglomeration C5B. 2019 (Figure 178).
Two fragments of the same vessel; yellowish fabric with fine mica and sand in composition; traces of red paint on the interior face; marginal groove.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m
Dimensions: diam. *c.* = 0.165 m; rim height = 0.018 m.

B 5. Fish-plate – Pottery agglomeration C5B. 2019 (Figure 178).
Fragment; the depression with a marginal groove was preserved; horizontal walls; relatively high support foot; brick-coloured fabric with ingredients similar to Sinope products; striations on the dorsal face due to the fabrication process.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m
Dimensions: diam. preserved = 0.13 m; diameter of central depression = 0.065 m; preserved height = 0.025 m.

B 6. Fish-plate – Pottery agglomeration C5B. 2019 (Figure 178).
Fragment with depression; intensely yellow-coloured fabric, compact; traces of brown paint on the interior and exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.105 m; diameter of central depression = 0.045 m; diameter of the base (exterior) = 0.085 m.

B 7. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 178).
Fragment with depression; groove on the depression margin (a feature common to the other fragments); thicker walls; traces of brown paint on the exterior and interior; higher support foot.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. preserved = 0.075 m; diameter of central depression = 0.045 m.

B 8. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 178).
Fragment of wall and depression; beige fabric; traces of brown paint on the interior side.
Dimensions: diam. preserved = 0.09 m; diameter of central depression = 0.047 m.

B 9. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 178).
Fragment with depression; yellowish compact fabric; lustreless black glaze on the exterior
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. preserved = 0.063 m; diameter of central depression = 0.03 m.

B 10. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 178).
Fragment of wall and depression; fabric with sandy ingredients (similar to Sinope products); traces of brown paint on the exterior; highly projecting foot.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. preserved = 0.12 m; diameter of central depression = 0.065 m; height = 0.028 m.

B 11. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 179).
Fragment of wall with depression; yellowish fabric; black glaze on the exterior and interior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. preserved = 0.078 m; diameter of central depression = 0.035 m.

B 12. Fish-plate – Pottery agglomeration C5B. 2019 (Figure 179).
Fragment of wall and rim; fabric with sandy ingredients and mica; traces of red paint on the exterior in thin layer.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 2 and 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: rim thickness = 0.07 m; rim height = 0.02 m.

B 13. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 179).
Fragment of wall and rim; striations on both the interior and dorsal faces from potter's wheel.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. preserved = 0.06 m; rim height = 0.02 m.

B 14. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 179).
Fragment of wall and rim. It has striations on the dorsal side and a fine groove around the floor margin; faint traces of brown paint.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. preserved = 0.10 m; rim height = 0.022 m.

B 15. Fish-plate – Pottery agglomerations C5B. Find list P52. 2019 (Figure 177).
Several fragments possibly fro two different vessels; beige-yellow fabric, compact, with yellow slip on the exterior. Fragment of the plate and bent rim; it has a circular groove on the margin. Aa1/a2 and b1/b2 might be part of the same vessel; c1/c2 and d1/d2 might be part of a second vessel.
Discovery context: north-west sector, *krepis* 'gate', S10, sq. 2 and 3, absolute elevation 45.00 m.

B 16. Fish-plate – Pottery agglomeration C6. Find list P115. 2019 (Figure 177).
Several fragments of plate and rim; brown fabric, compact; exterior covered in black matt paint in thin layer; circular groove on the margin. Similar with fragments from B 17 and B 18.
Discovery context: north-west sector, *krepis* 'gate', S11.
Dimensions: the largest fragment has a diam. of 0.175 m.

B 17. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 179).
Several wall and rim fragments; marginal grooves; rims bent at right angle; black glaze, lustreless, on the interior and exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4 pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.

B 18. Fish-plate – Pottery agglomerations C5A-B. 2019 (Figure 179).
Several wall and rime fragments (smaller fragments); marginal grooves; downturned rims bent at right angle; black glaze, lustreless, on the interior and exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4; pottery agglomerations C5A-B; absolute elevation 44.70 m - 45.00 m.

C. Bowls (C 1-17)

The frequency of finds in this category comes near to that of fish-plates. Taking into consideration vessel shape we can distinguish between bowls of hemispherical and angular profiles. Another criterion for classification is the presence or absence of stamped decoration. In a single case (cat. C 1) we can recognize a bowl with angular profile and stamped decoration. For another three fragments, presenting a single stamped palmette, we cannot identify a shape. Because of this, we adjusted our classification of bowls with stamped decoration (C 1-4) and bowls without decoration (C 5-13). In the second category we included bowls of hemispherical body (C 5-7) and bowls with a profiled shoulder or angular profile in their upper part (C 8-15). A third group (C 16-17) includes those fragments too inconclusive for individual categorisation.

Bowls with stamped decoration C (C 1-4)

Bowls with stamped decoration are represented mainly by a find partially reconstructed and characterized by an angular profile (C 1). The vessel preserves inside five palmettes (from a total of six), surrounded by a triple circle made with a toothed wheel. We can recognize the shape at Rotroff (1997: cat. 869-870), dated *c.* 300 BC. Similar examples are known from Istros, in T. XXXIII, dated at the end of the 4th c. BC (Alexandrescu 1966: 182, T. XXXIII/4, pl. 91; 1978: cat. 588) and in Schmid's publication (2000: 361-372 and pl. 182, cat. 15), with a close date, i.e. end of 4th - first decades of the 3rd c. BC). An analogous vessel from the Callatis necropolis was dated to the 3rd c. BC (Preda, Georgescu 1975: 58, fig. V/2, VI/2).
On another three fragments the decoration was represented by one stamped palmette (preserved from a group of perhaps four, arranged in a cross pattern), surrounded in a single find (cat C 2) by incised rouletting. The vessels had a compact beige fabric, covered on the interior and exterior with black glaze, lustreless, partially removed. Taking into consideration the preserved diameters (0.045 - 0.057 m), the vessels were small. In a single case (cat C 2) the vessel had a wider body, of which the slightly incurved rim has also survived.
Entire shapes are known from Corinth (Edwards 1975: cat. 27-32), dated *c.* 250-146 BC, and Lamia (Papakonstantinou 1997: 50-58, pl. 43/α-γ).[5] Rotroff (1997: cat. 639-640, 866) documents the same type of palmette as the Documaci finds, on the bottom of

[5] At Lamia, the vessels were found in the same context with nine *unguentaria* and bronze coins dated 3rd - 2nd c. BC.

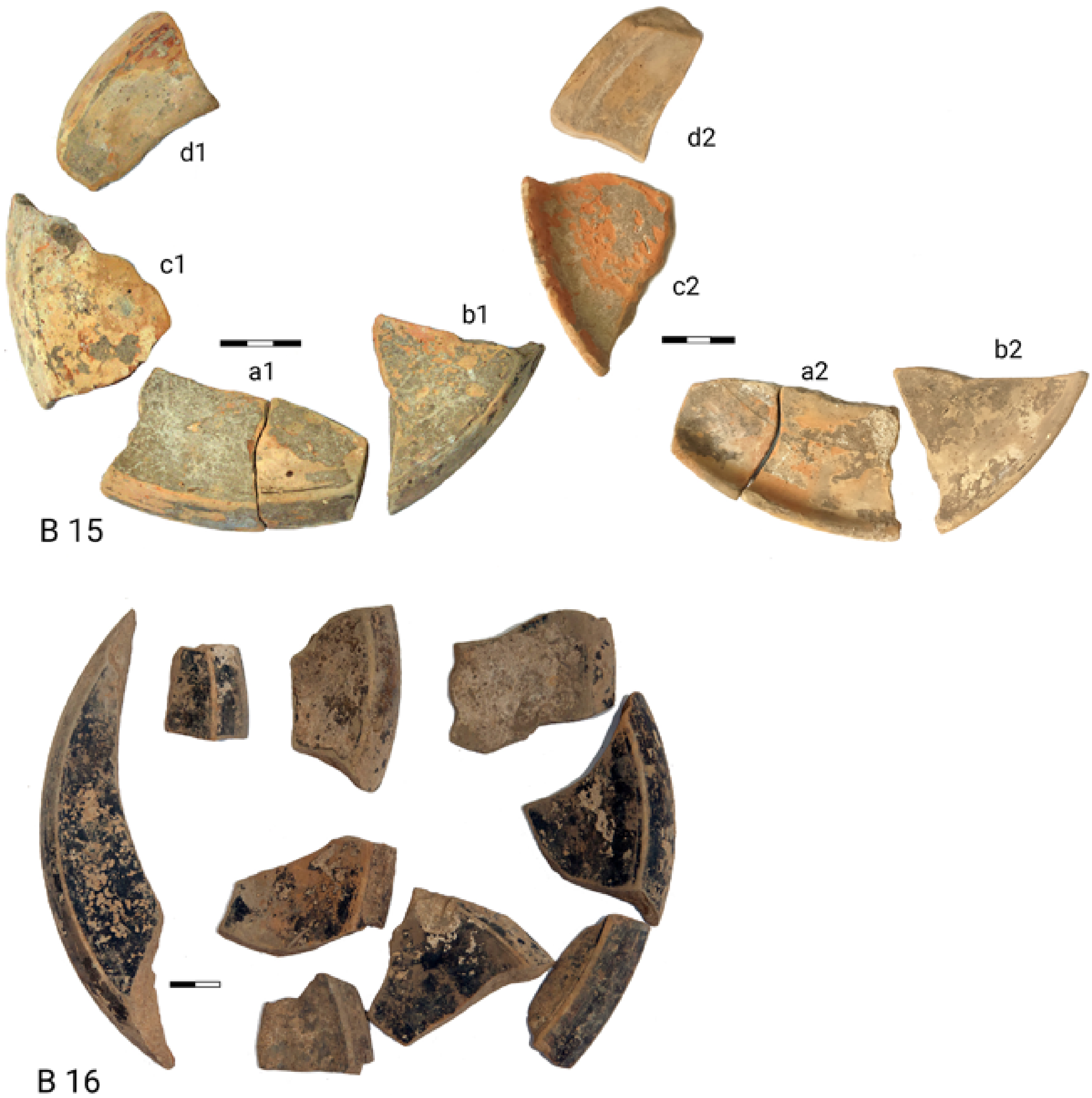


Figure 177. Fish-plates found at Documaci (B 15 - B 16) (photos by D. Ștefan).

Attic vessels (plates or bowls) dated to the end of the 4th - first quarter of 3rd c. BC. The closest seem to be categories 869, 874, 877, 878, dated c. 300 BC or 290-275 BC. At Istros, bowls with the same ornamentation were in use from the last quarter of 4th - first half of 2nd c. BC (Alexandrescu 2005: 369, C 208, fig. 52).[6] The closest analogies come from Istros tumulus XXXIII/2 (Alexandrescu 1966: 182, pl. 91; 1978: cat. 596), dated end of 4th c. BC, and from Callatis territory, a at tomb under a mound at 2 Mai village, where fragments decorated with palmettes, some surrounded by rouletting, were also found (Preda 1962: 162, 164, fig. 6/2, 5, 7). At Albești, vessels decorated with palmettes are regularly found in contexts with amphorae stamps of Heraclea Pontica (4th group), dated end 4th - first quarter 3rd c. BC (Buzoianu, Bărbulescu 2008: cat. C 119, 137-139).[7]

C 1. Bowl – Pottery agglomeration C5B. Find List P94 2019 (Figure 180).

Partially reconstituted, belonging to category of bowls with out-turned rim, carinated profile towards the base

[6] Alexandrescu 2005: 369, C298 – stamped decoration – four vine leaves in ovoid medallion, surrounded by rouletting; specimen dated by analogy with an item from Olbia at end of 3rd - first half of 2nd c. BC. See also at Alexandrescu 1966: 191, T. XXVI/14, pl. 91, a find dated first quarter of 2nd c. BC, or *c.* 176-174 BC.

[7] The most similar in terms of palmette arrangement is C 138.

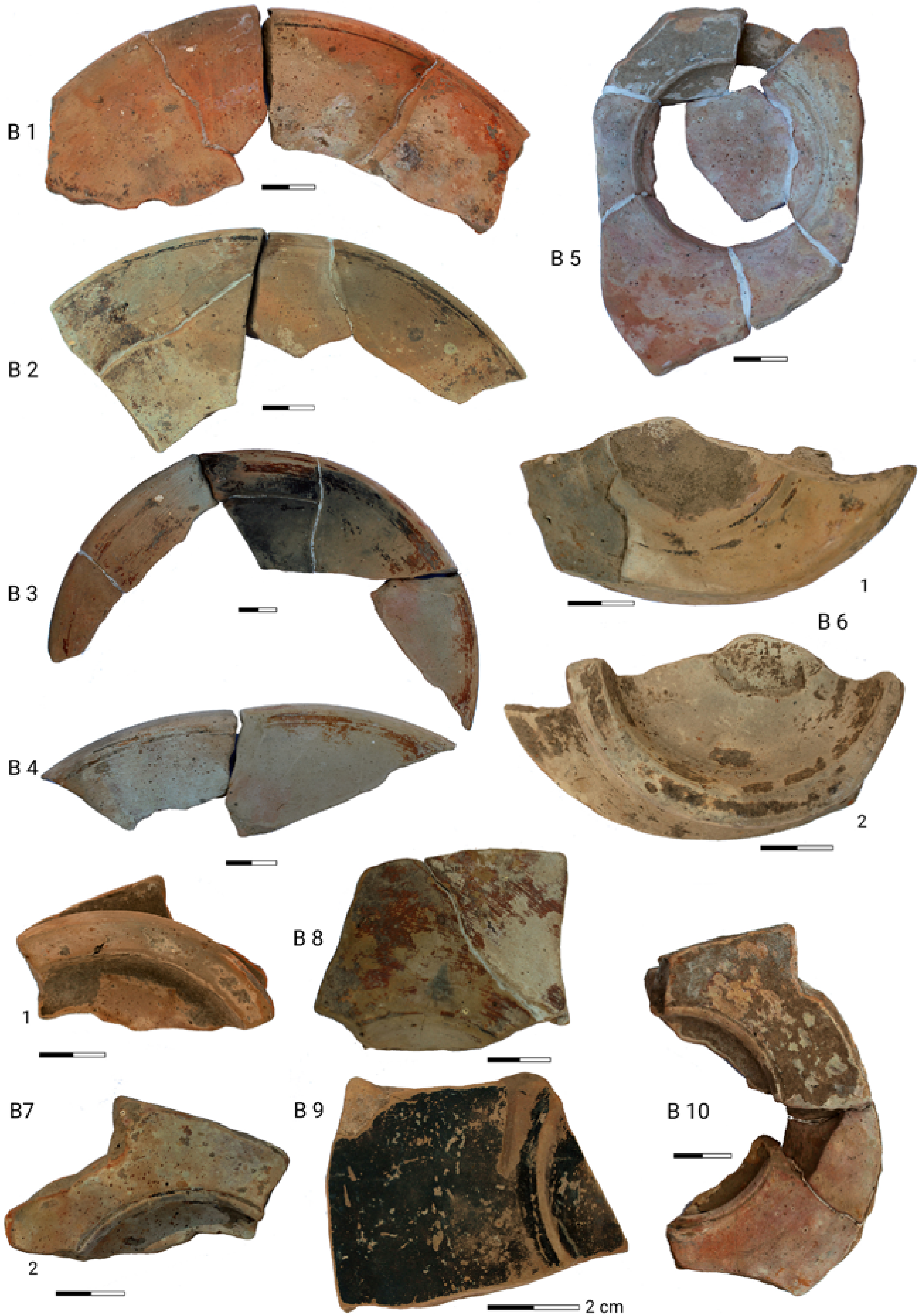


Figure 178. Fish-plates found at Documaci (B 1-B 10) (photos by L. Buzoianu).

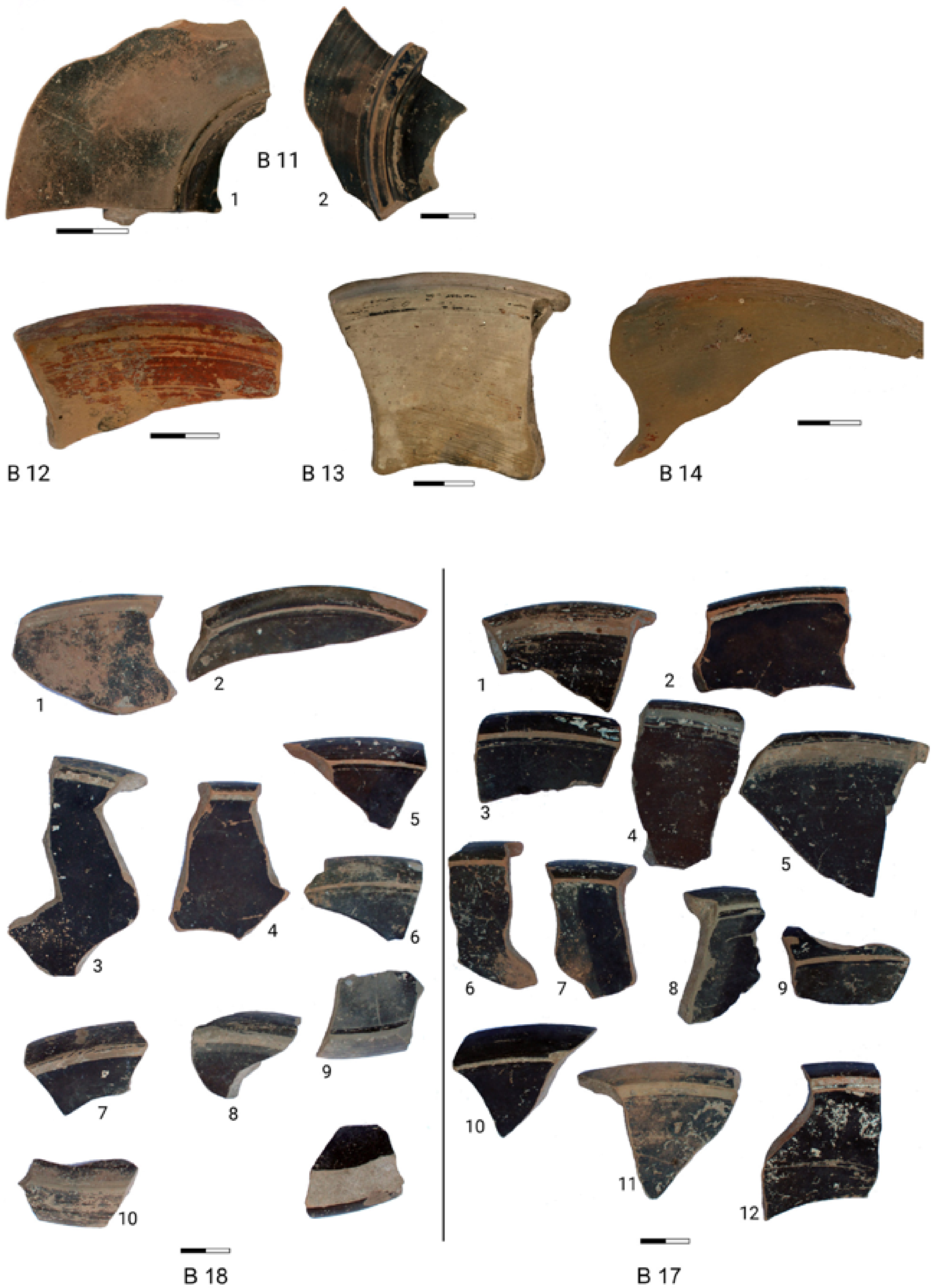


Figure 179. Fish-plates found at Documaci (B 11 - B14 and B 17 - B18) (photos by L. Buzoianu).

and strongly profiled foot. Decorated on the interior with five stamped palmettes in medallion (preserved from a probable total of six), surrounded by three circles made with a toothed wheel.
Discovery context: S10, sq. 3; absolute elevation 44.90 - 45.00 m; pottery agglomeration (ritual deposit) C5B, in a reserved area of the mound on the occasion of the burial, or at a subsequent commemoration ritual.
Dimensions: diameter = 0.239 m; diameter of the base = 0.118 m; height = 0.06 m.
Date: end of the 4th - first decades of 3rd c. BC.

C 2. Bowl – Pottery agglomeration C5B. 2009 (Figure 181).
Bowl base; decorated with one palmette; beige fabric; black glaze, lustreless, on the interior and exterior; corroded.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.057 m; diameter of base = 0.056 m.

C 3. Bowl – Pottery agglomeration C5B. 2009 (Figure 181).
Bowl base; decorated with one palmette. The fragment is worn and the black glaze completely disappeared.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.045 m.

C 4. Bowl – Pottery agglomeration C5B. 2009 (Figure 181).
Bowl fragment decorated with one palmette; thin walls; beige clay; brown lustreless glaze on the exterior and interior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3 pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m
Dimensions: diam. preserved = 0.047 m

Bowls without decoration (C 5-C15)

Undecorated bowls with hemispheric body (C 5-7)

Three fragmentary specimens can be included in this category. They belong to a shallow type with hemispherical body and incurved rim. The shape appears in the catalogues of Thompson (1934: cat. A 14-18) and Edwards (1975: cat. 95), dated *c.* 300 BC. Rotroff (1997: cat. 983-992) dates them *c.* 310/300 BC - 250 BC. A specimen in tumulus XXXIV at Istros was dated with finds of 'West-Slope' pottery *c.* 260-250 BC (Alexandrescu 1966: pl. 92, T. XXXIV/19). Other items have wider time spans, e.g. 3rd - 2nd c. BC at Tomis (Bucovală 1967: 41-42/f, g) or within the 3rd c. BC at Albești (Buzoianu, Bărbulescu 2008: C 121, 122), with one find dated to the first quarter of the 3rd c. BC (with a Heraclea Pontica stamp LFG or group IV) and another towards the middle and second half of the 3rd c. BC.

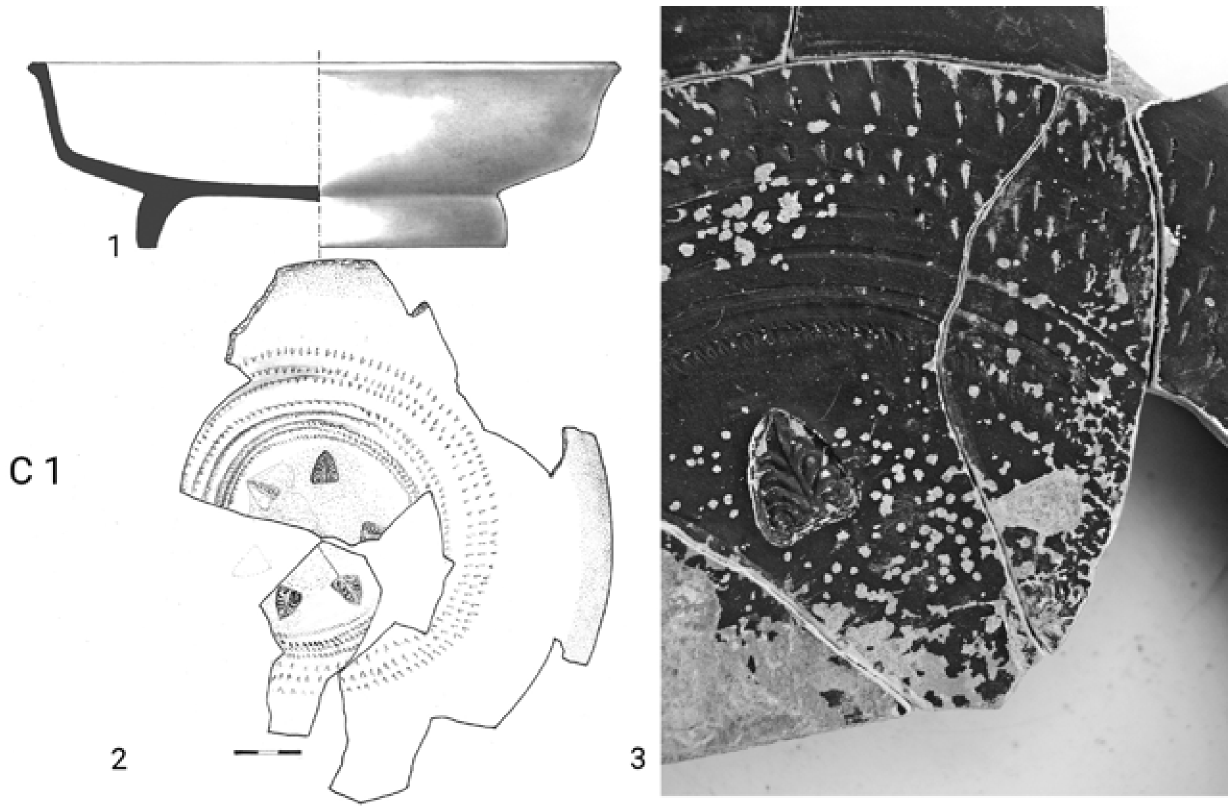


Figure 180. Bowl with stamped palmettes (cat. C 1) found at Documaci (drawing by Fl. Marțiș; photo by V. Sîrbu).

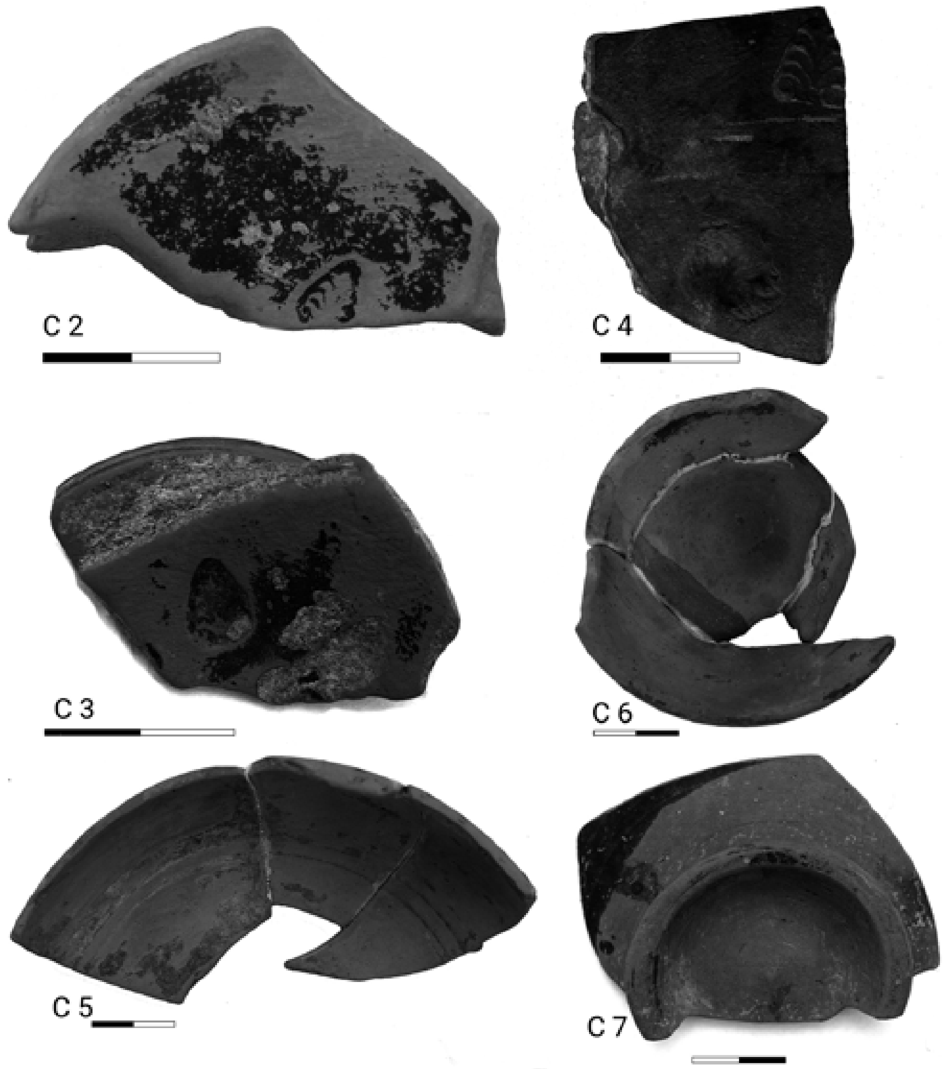


Figure 181. Stamped bowls (C 2-C 7) (photos by L. Buzoianu).

C 5. Bowl – Pottery agglomeration C5B. 2009 (Figure 181).
Fragmentary; wide body, hemispherical; rim slightly incurved; flat base; pink-yellowish fabric, covered in glaze; exterior groove along the rim; three fine grooves inside the vase.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. = 0.12 m; preserved height = 0.035 m.

C 6. Bowl – Pottery agglomeration C5B. 2009 (Figure 181).
Fragmentary; low body, less high; rounded rim, incurved; beige, compact fabric with fine inclusions; traces of black glaze, corroded, on the inner and exterior sides of the vessel, along the rim.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. = 0.074 m; diam. base = 0.042 m; height = 0.03 m.

C 7. Bowl – Pottery agglomeration C5B. 2009 (Figure 181)
Fragmentary; wide body; ring foot; beige clay, compacted; black-brown glaze in the interior and in one area on the exterior (with leaks).
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.085 m; diam. base = 0.06 m; preserved height = 0.028 m.

Undecorated bowls with profiled shoulder (C 8-15)

This category is represented by several fragmentary specimens. They belong to the type with short walls, out-turned rim (in a single case horizontal, slightly depressed). In the superior part, immediately under the rim, their profile is concave. Made in beige clay, with interior and exterior surfaces covered in black lustreless glaze, turned in brown. The preserved diameters vary between 0.055 m - 0.08 m, while the height (likewise partially preserved) is 0.03 m - 0.04 m. Similar shapes can be noticed in two Attic specimens from Istros (Alexandrescu 1966: 188, pl. 92, T. XXXIV/20, XXXIV/21), dated *c.* mid 3rd c. BC with a 'West-Slope' kantharos (Alexandrescu 1966: pl. 76 and 92, T. XXXIV/14), dated *c.* 260-250 BC. A third specimen, also from Istros, with the superior concavity up to middle vessel height and a larger diameter, belongs to the first quarter of the 2nd c. BC. (Alexandrescu 1966: 191, pl. 93, T. XXVI/14). Two bowls were found in the mound at 2 Mai, near Callatis, dated first half of 3rd c. BC (Preda 1962: 163, fig. 5/7, 10).

C 8. Bowl – Pottery agglomeration C5B. 2019 (Figure 182).
Fragmentary body; carinated profile; black glaze, lustreless on the interior and exterior, turned partially into brown.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.07 m; height = 0.023 m.

C 9. Bowl – Pottery agglomeration C5B. 2019 (Figure 182).
Fragmentary body; carinated profile; beige fabric; brown paint, lustreless on the interior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.055 m; height = 0.025 m.

C 10. Bowl – Pottery agglomeration C5B. 2019 (Figure 182).
Two fragments, body; short walls; carinated profile.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. *c.* = 0.08 m.

C 11. Bowl - pottery agglomeration C5B. 2019 (Fig. 182)
Two fragments, probably of the same vessel; carinated profile; horizontal rim, slightly concave; beige fabric; brown paint on the interior and exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.

C 12. Bowl – Pottery agglomeration C5B. 2019 (Figure 182).
Two fragments of the same vessel; carinated profile; black lustreless glaze on the exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.

C 13. Bowls – Pottery agglomeration C5B. 2019 (Figure 182).
Several fragments (generally rims); bowls with carinated profile. One of the fragments preserves the remains of the foot, relatively high and slightly flared (projecting). Black lustreless glaze on the interior and exterior, one of the fragments has it only on a reserved area around the rim.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. range 0.06 m - 0.027 m.

C 14. Bowls – Pottery agglomeration C6. Find list P115. 2019 (Figure 182).
Several fragments from the upper part of bowls with carinated profile. One of the fragments preserves a larger diameter (0.085 m) and has the rim almost straight. Covered with beige-yellow slip, and ochre-brown paint.
Discovery context: north-west sector, inside the *krepis* 'gate'; S11; sq. 4 and 5; pottery agglomeration C6; absolute elevation of 45.09 m.

C 15. Bowls – Pottery agglomerations C5B. Find list P52. 2019 (Figure 182).
Fragments of the same type; the concavity under the rim is more pronounced; beige-yellow fabric covered with ochre-brown paint.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.

Various fragments (C 16-17)

Several bases, with smaller diameters and rims with straight profile, out-turned or slightly concave, may belong to some of the catalogued bowls.

C 16. Bowls – Pottery agglomeration C5B. 2019 (Figure 183).
Small vessels bases (probably bowls).
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. Range between 0.023 m - 0.028 m.

C 17. Bowls – Pottery agglomeration C5B. 2019 (Figure 183).
Several fragments of bowl rims of various types; carinated profile, straight or slightly concave (for lids).
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.

D. Plates (D 1-5)

We include here five fragmentary specimens. They are characterized by a horizontal profile, slightly thickened rim (cat. D 1), or rim strongly rolled towards the interior (cat. D 4). The beige, compact fabric is covered in lustreless black glaze. Three items bear traces of decoration: horizontal bands in darker colour inside (cat. D 2), line of incisions with roulette (cat. D 3) and two circular grooves on the exterior (cat. D 4).

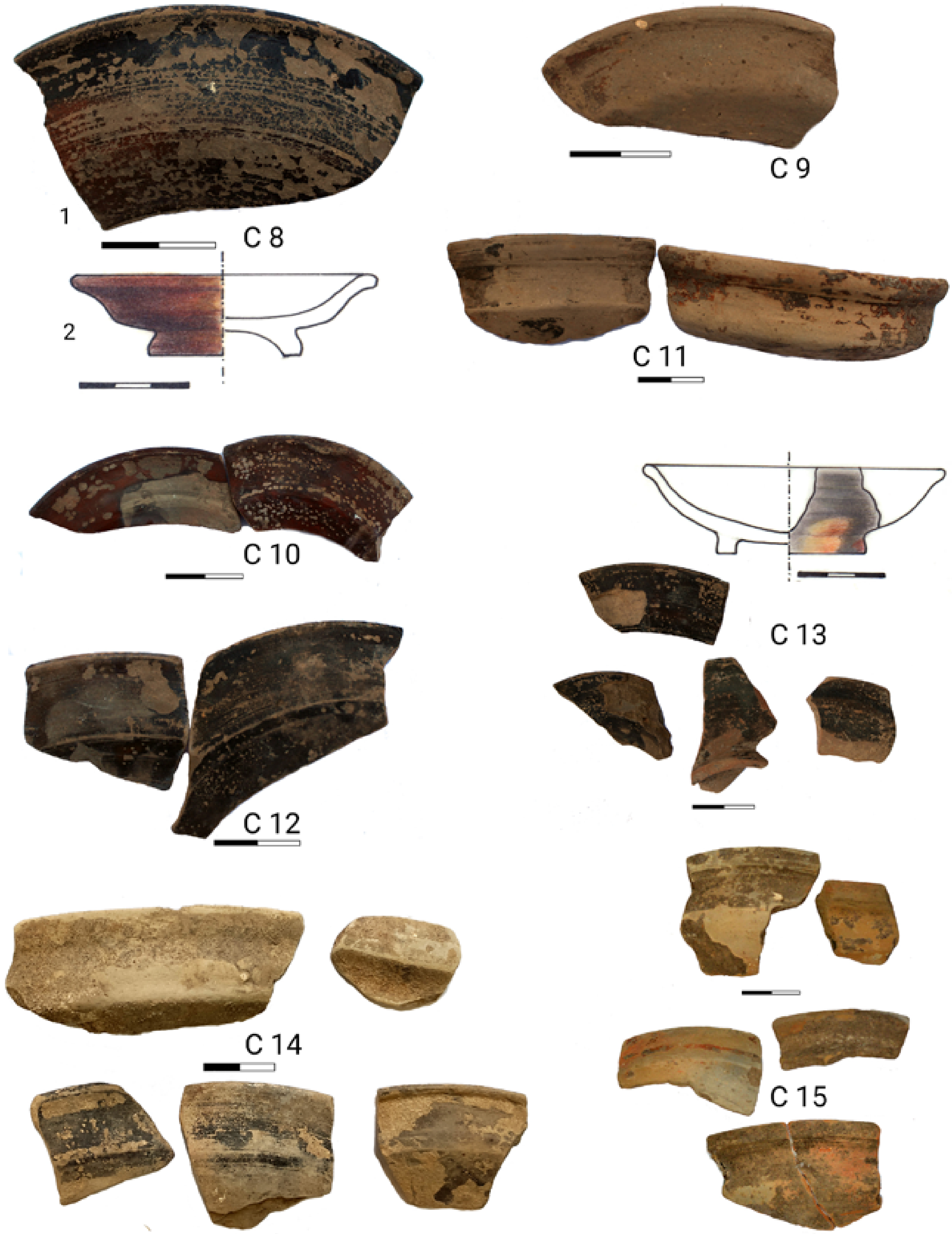


Figure 182. Small undecorated bowls with carinated profile found at Documaci (C 8 - C 15).
(photos by L. Buzoianu, drawings by Fl. Marțiș).

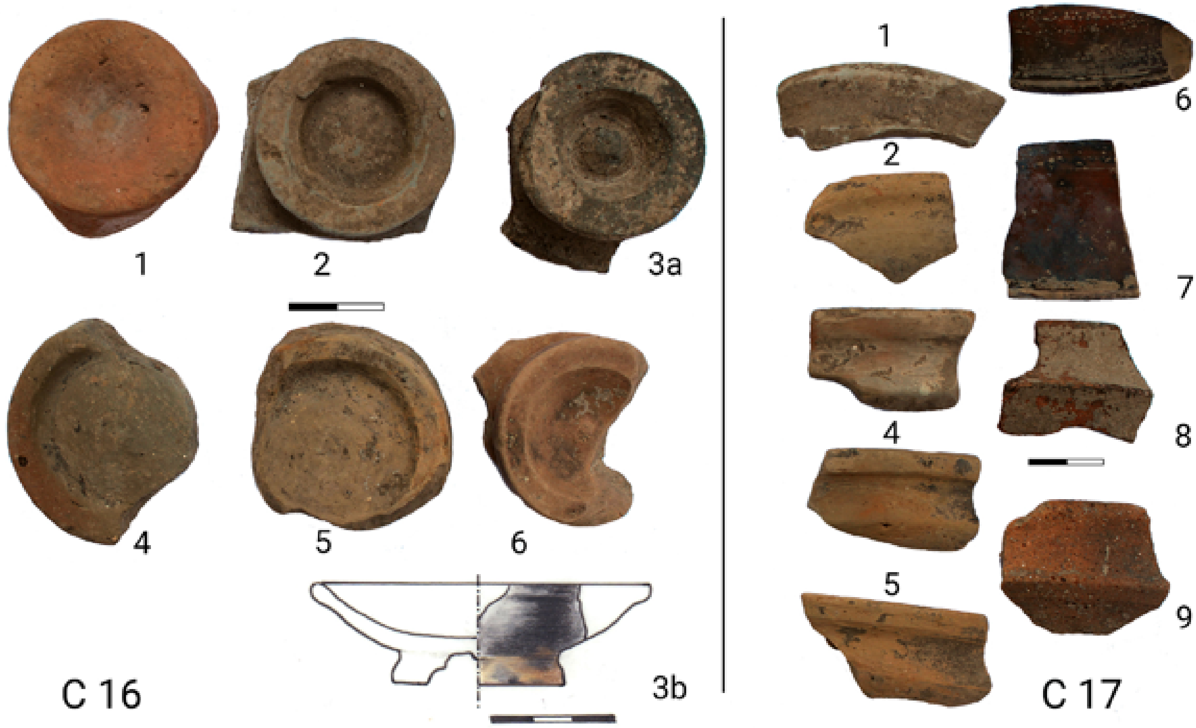


Figure 183. Undecorated bowls from Documaci (C16 - C 17). (photos by L. Buzoianu, drawing by Fl. Marțiș).

Similar shapes were dated by Rotroff (1997: cat. 650-652) *c.* 300-275 BC. At Istros one find was also put at 300-275 BC, or towards 275 BC (Alexandrescu 2005: C213), while another (Alexandrescu 2005: C214) was dated (200-175 BC). A fragmentary item from the 2 Mai tumulus, similar to Documaci cat D. 2, was dated to the beginning of the Hellenistic period (Preda 1962: 162, fig. 5/9).

D 1. Plate – Pottery agglomerations C5B. 2019. Find list P52 (Figure 184).
Three fragments of a single plate; horizontal profile; wide walls with slightly thickened rim; yellowish fabric, fine; black glaze, corroded, on the exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: 0.10 m diameter.

D 2. Plate – Pottery agglomerations C5B. 2019 (Figure 184).
Fragment; horizontal profile; thick walls; beige, compact fabric; black lustreless glaze on the exterior and interior, partially removed; circular white bands inside.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: preserved diameter = 0.078 m; preserved height = 0.02 m; walls width = 0.013 m.

D 3. Plate – Pottery agglomerations C5B. 2019 (Figure 184).
Fragment; thick walls; heavy support foot; beige fabric; brown glaze on the exterior and interior; band of rouletting grooves on the interior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: diam. preserved = 0.057 m; preserved height = 0.024 m.

D 4. Plate – Pottery agglomerations C5B. 2019 (Figure 184).
Rim fragment, thickened towards interior; thick wall; beige fabric, compact; black lustreless glaze; two circular grooves on the exterior.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B; absolute elevation 44.90 m - 45.00 m.
Dimensions: preserved diameter = 0.065 m.

D 5. Plate – North-west sector. Embankment. Find list P113. 2019 (Figure 184).
Fragment, part of the base; intense orange coloured fabric, fine quality; ring base; decorated with linear incisions in the interior.

Discovery context: S10; sq.7, in the layers that have slid down from the embankment in antiquity, in the area of the *krepis* 'gate'.

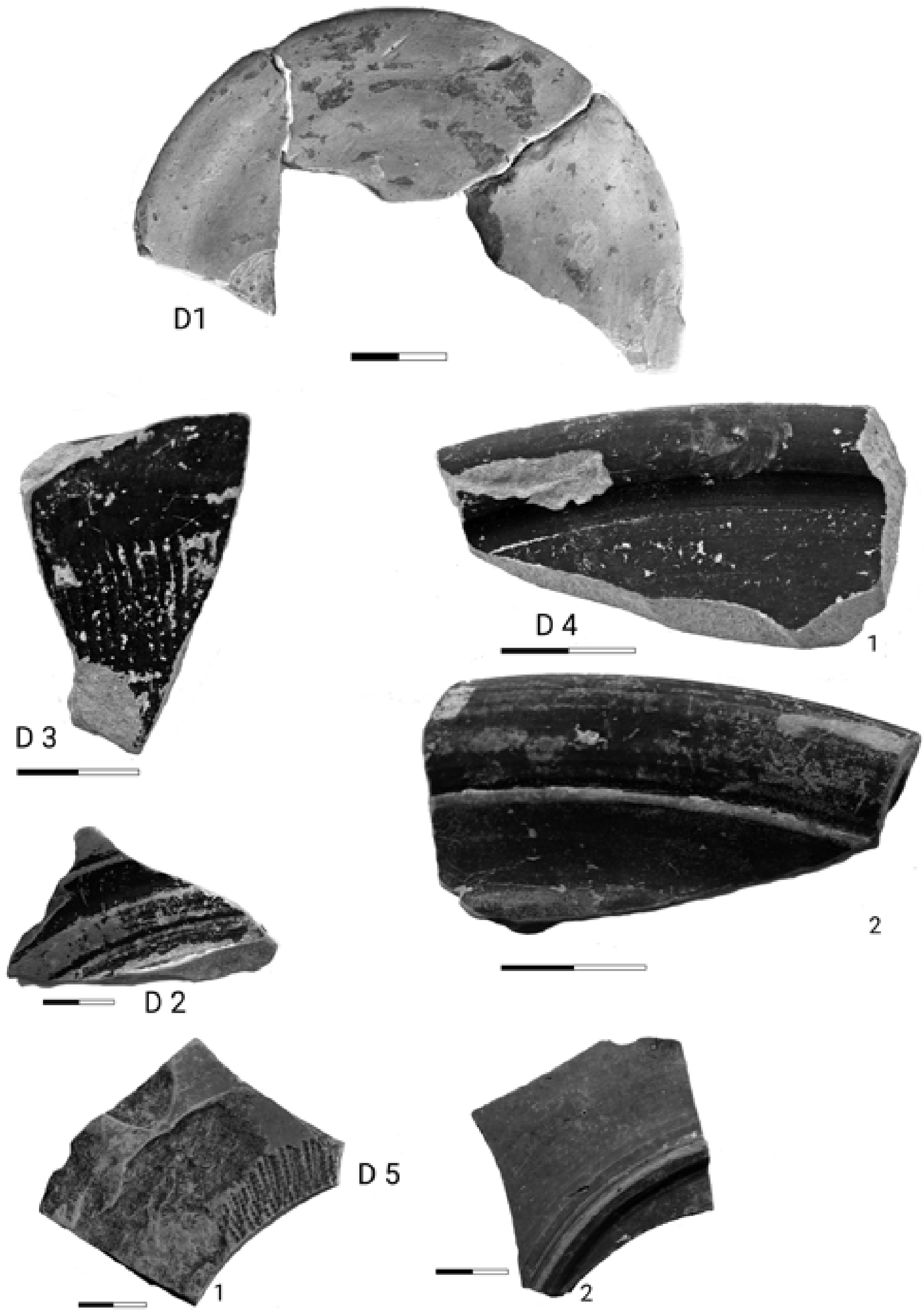


Figure 184. Plates from Documaci (D 3-D 5) (photos by L. Buzoianu).

E. *Lekanides* (E 1-2)

This category is represented by two vessels of different typology. The first (cat. E 1) belongs to the type with hemispherical bowl, without handles, rim with angular profile or carinated in the upper part. Similar shaped vessels were documented by Rotroff (1997: cat. 1254-1255) and dated 300-275 BC. Another analogy comes from Eretria, dated end of 4th - first half of 3rd c. BC (Schmid 2000: pl. 182/17). More items (seven) were found at Albești in contexts with amphorae stamps of Pontica group IV, Rhodes period II and Sinope sub-group VI D (Buzoianu, Bărbulescu 2008: C 142-148, pl. XLIV).The nearest shape is the specimen C 142, found in context with an amphora stamp of Heraclea Pontica group IV and a fragmentary amphora of Thasos.

The second *lekanis* (cat E. 2) belongs to the type with hemispherical body, incurved rim and ring foot. The vessel's inner side and a reserved area on the exterior, along the rim, were covered in red or brown paint, applied irregularly. They preserve the shape of deep bowls, with in-turned rim. The type is common in the western-Pontus area; its shape was labelled as 'dish

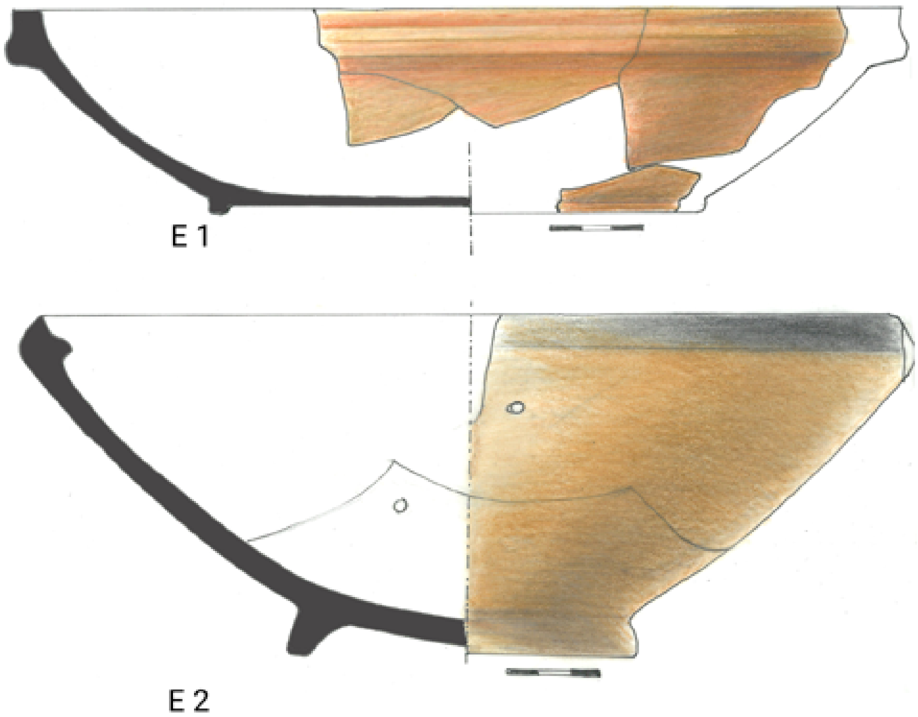


Figure 185. *Lekanides* from Documaci (E 1-E 2) (drawings by Fl. Marțiș).

bowl' at Istros and dated towards the end of the 2nd c. BC (Alexandrescu 1966: 196, pl. 98, T. XXXVII/25, pl. 98), the same as an item originating from Callatis (Bârlădeanu-Zavatin 1980: 230, pl. VI, 3) dated also 2nd c. BC. The Documaci lekanis cat. E 2 matches the type II from Apollonia Pontica (Ivanov 1963: 227-228), dated second half of 4th - beginning of 3rd c. BC. Similar shapes were found at Olbia (Parovic-Pesikan1974: fig. 82/2-3), Mirmekkyon (Gajdukevich 1987: 76-77, fig. 29/2), 3rd c. BC, and Albești (Buzoianu, Bărbulescu 2008: cat. C 123-128), here labelled as bowls with inturned rims. Among the specimens discovered at Albești, the nearest shape is item C 128, found in context with several amphorae stamps, of which the earliest were of Heraclea Pontica and Thasos (end of 4th - beginning of 3rd c. BC) and the latest being Rhodes period II and Sinope sub-group VI D (second half of 3rd c. BC).

E 1. Lekanis – dismantled dromos II sector. Find list P37. 2018 (Figure 185).
Fragmentary; the superior part of the vessel; hemispheric body; straight rim, projecting (carinated profile); flat base; pink-brick coloured fabric; slight grooves under the rim.
Discovery context: S8, sq. 1, western profile, absolute elevation 44.80 m; a layer of secondary filling of Late Roman period corresponding to the dismantling of the eastern sector of *dromos* II.
Dimensions: diam. *c.* = 0.290 m; height = 0.066 m; diam. of base = 0.16 m; rim width = 0.009 m

E 2. Lekanis – Embankment in dromos II area. Find list P27. 2018 (Figure 185).
Fragmentary; hemispherical body, deep; slightly concave rim, in-turned; ring foot; beige or brick-coloured fabric; black engobe inside and on the exterior on a reserved area around the rim; traces of reparations (two circular holes on the walls and one towards the base).
Discovery context: S1, sq. 10; embankment – the monticule built to the south of *dromos* II, under support wall Z5.
Dimensions: diam. preserved = 0.26 m; diam. foot = 0.11 m.

F. Lids (F 1-2)

This category is represented by two fragmentary items. They belong to the type with conic profile, not high, topped by a cylindrical button with central concavity. Analogous shapes were documented at Corinth (Edwards 1975: cat 697) and dated to the middle of the 4th - first half of 3rd c. BC. Similar lids were found in the tumulus tomb at the village of 2 Mai (Preda 1962: 162-165, Figure 5/11-12, 6/1) and necropolis of Callatis (Bârlădeanu-Zavatin 1980: 231, pl. VII/4). One lid of this type was discovered at Albești in context with a Thassos amphora stamp belonging to the magistrate Φανόλεως, dated towards the middle 3rd c. BC (Buzoianu, Bărbulescu 2008: cat. C 166, pl. XLVI).

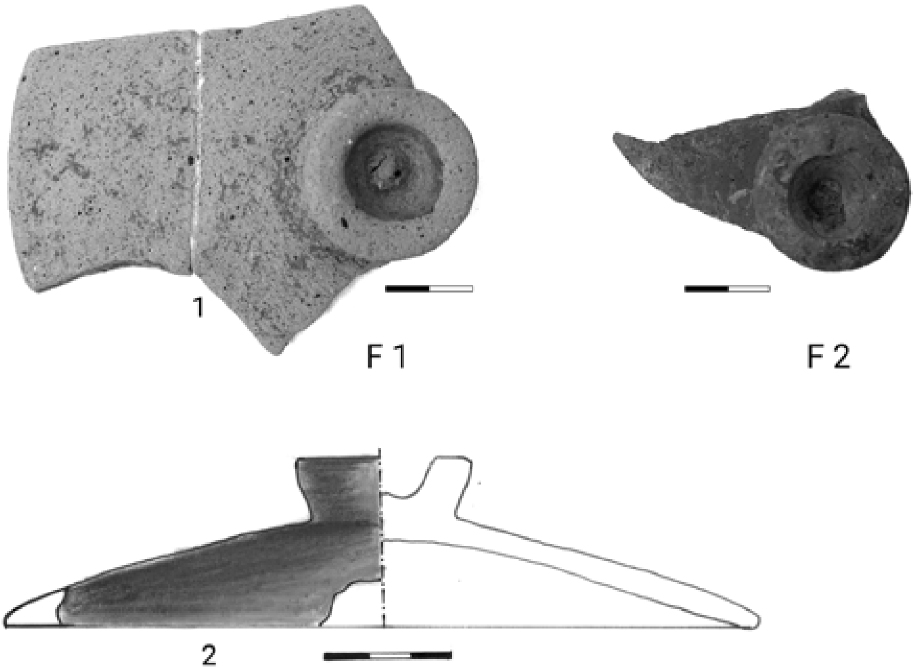


Figure 186. Lids found at Documaci (F 1-F 3) (photos by L. Buzoianu; drawing by Fl. Marțiș).

F 1. Lid – Pottery agglomeration C5A. Find list P103. 2019 (Figure 186).
Fragmentary; conic profile, not high; cylindrical gripping button with central concavity; brick-coloured fabric with limestone and sandy ingredients (analogous to Sinope clays).
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 4, pottery agglomeration C5A, absolute elevation 44.70 m - 44.80 m
Dimensions: diam. disk = 0.11 m; diam. button = 0.037 m.

F 2. Lid - pottery agglomerations C5A-B. 2019 (Figure 186).
Fragment (only the button was preserved); cylindrical button with central concavity.
Discovery context: North-west sector, inside the *krepis* 'gate'; S10, sq. 3 and 4, pottery agglomerations C5A-B, absolute elevation 44.70 m - 45.00 m.
Dimensions: diam. button = 0.034 m.

G. Other Hellenistic age vessels (G 1-3)

In this category we included vessels of clear typology, but which are represented only by a single specimen. We refer to the *unguentarium*, *kantharos* and an *askos*. The morphological characteristics suggest a date at end of 4th - first half of the 3rd c. BC. For the kantharos we cannot exclude an even lower chronology (e.g. 350-325 BC). Both categories are found in funerary inventories along the western Pontus area.

G 1. Unguentarium – Pottery agglomeration C5B. Find list P60. 2019 (Figure 187).
Fragmentary; the lower part of the vessel including bottom survives; low base; discoidal flat foot; rounded body, slightly widened towards the base; thin walls; yellowish fabric; black lustreless paint on the exterior, including on the base.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B, absolute elevation 44.90 m.
Dimensions: preserved height = 0.042 m; diam. of base = 0.022 m.
Analogies: Rotroff 1997: cat. 1171 (250-210 BC); Alexandrescu 1966: pl. 92, T.XXXIV/15 (with a recalibrated chronology of 260-250 BC); Bucovală 1967: 19/b (in a grave dated end of 4th - beginning of 3rd c. BC); Bârlădeanu-Zavatin 1980: 218-219, pl. I/2 (amphora *unguentarium*), 233, pl. VI/4 (end of 4th - beginning of 3rd c. BC); Buzoianu, Bărbulescu 2008: C 86 (in the same context with a Heraclea Pontica amphora stamp of the 4th group); Proskynetoupolou 2000: pl. 207/d (M 734, first half 3rd c. BC).

G 2. Kantharos – Pottery agglomeration C5B. Find list P82. 2019 (Figure 187).
It was almost entirely reconstructed from several fragments; conical body; thin walls; flared out plain rim; circular base with scraped out groove, cylindrical in section foot; concave underside; beige fabric; black lustreless glaze; decorated under the rim with a garland of ivy leaves.

Figure 187. Hellenistic vessels: *askos* of *guttus* type (G 3); *unguentarium* (G 1); *kantharos* (G 2) (photos by L. Buzoianu; drawings by Fl. Marțiș).

Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B, absolute elevation 44.90 m.
Dimensions: height 0.088 m; diam. mouth = 0.107 m; diam. base = 0.022 m; lengths of handles = 0.062/0.066 m; handle diam. = 0.01/0.012 m.
Analogies: at Istros: T. XXXIV (Alexandrescu 1966: 187, XXXIV/8, pl. 76, 92) (towards the mid 3rd c. BC); Coja, Dupont 1979: 45, pl. 2/12, 13 (3rd c. BC.); Bucovală 1967: 20/a (reassessed in Lungu 2013: C 77, dated 250-225 BC; 23/a, 26/a, 3rd c. BC). Analogies in Rotroff 1997: types 134, 135 dated 285-275 BC.

G 3. Askos of guttus type – Pottery agglomeration C5B. 2019 (Figure 187).
Fragments of the superior part (rim and neck); narrow cylindric neck, fared out in the upper part (funnel-shaped); horizontal rim rolled out; compact pink fabric; covered in lustrous, black glaze; by the shape of its upper part it can be related to a specimen from Tomis (Bucovală 1967:15/b), considered a Pontic product, possibly Chersonesos, and dated towards 250 BC (Lungu 2013: 254, G1). The Tomis item has close analogies in Rotroff 1997: 353, nr. 1146 and Belov 1963: 167, fig. 28B. Several entire specimens found as ritual offerings associated with fireplaces for graves at Apollonia Pontica-Kalfata (Damyanov 2017: 91-92, fig. 7/8, 8/3, 9/2, 10/14, 11/8) were dated between 360/350-280 BC.
Discovery context: north-west sector, inside the *krepis* 'gate'; S10, sq. 3, pottery agglomeration C5B, absolute elevation 44.90 m.

J. Tiles and roof ridges (J 1-5)

J 1. Tiles and roof ridge – Embankment in dromos II area. Find list P26. 2018 (Figure 188).
Two tile fragments; one roof ridge fragment with rounded profile; yellow fabric with sandy black ingredients.
Discovery context: S1, sq. 10; absolute elevation 47.00 m; in a layer in secondary position with modern materials.
Dimensions (roof ridge): length = 0.18; wall width = 0.021 m.
Date: Hellenistic.

J 2. Tiles – Dismantled dromos II sector; Find list P17. 2018 (Figure 188).
Fragments of tiles; yellow clay with sandy, black ingredients; slightly rounded shape.
Discovery context: S1; sq. 6, absolute elevation 44.50 m; in the sector of the dismantled northern wall of *dromos* II, in a layer with Late Roman material.
Dimensions: 0.14 m x 0.13 m.
Date: Hellenistic.

J 3. Tile and roof ridge – Dismantled dromos II sector. Find list P20. 2018 (not illustrated).
Fragment of tile and roof ridge.
Discovery context: S1; sq. 6, absolute elevation 44.30 m; in the sector of the dismantled southern wall of *dromos* II, in a layer with Late Roman material.Date: Hellenistic.

J 4. Roof ridges – Dismantled dromos II sector. Find list P10. 2018 (not illustrated).
Discovery context: S1; sq. 6; near the concrete foundation of the modern entrance, in the 1993 trench filling.
Date: Hellenistic.

J 5. Tile – North-west sector; embankment. Find list P113. 2019 (Figure 188).
Fragment; thin; flat; red; compact.
Discovery context: S10; sq.7, in the layers that slid down from the embankment in antiquity in the area of the *krepis* 'gate'.
Dimensions: 0.170 m x 0.120 m x 0.025 m.
Date: Hellenistic.

J.6 Tile – North-west sector; embankment. Find list P113. 2019 (Figure 188).

Fragment; pink brick-coloured; thicker; with a fastening edge in right angle.
Discovery context: S10; sq.7, in the layers that slid down from the embankment in antiquity, in the area of the *krepis* 'gate'.
Dimensions: 0.165 m x 0.110 m. thickness: 0.022 m - 0.042 m.
Date: Hellenistic (?).

J 7. Tile – North-west sector; embankment. Find list P113. 2019 (Figure 188).
Fragment; orange fabric with large burnt clay ingredients; general rectangular shape with a slightly rounded profile.
Discovery context: S10; sq.7, in the layers that slid down from the embankment in antiquity, in the area of the *krepis* 'gate'.
Dimensions: 0.122 m x 0.185 m.
Date: Hellenistic(?).

K. Roman amphorae (K 1-4)

K 1. Amphorae – Dismantled dromos II sector. Find list P10. 2017 (Figure 189).
Fragments of walls; various types; brick-coloured fabric with ingredients, or orange fabric with yellow exterior; decoration with parallel, irregular grooves.*Discovery context*: S1; sq. 6-7; absolute elevation 44.60 m - 44.30 m.
Date: 5th-6th c. AD.

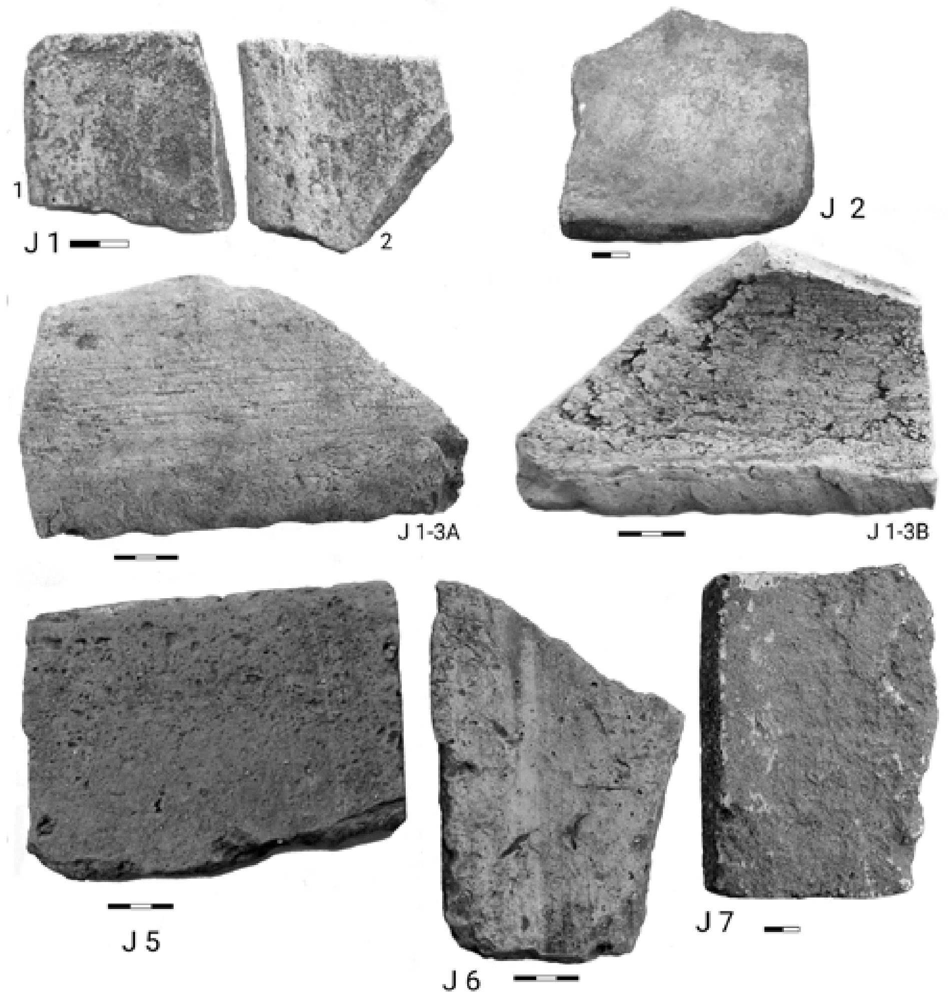


Figure 188. Fragments of tiles from Documaci (J 1-J 6) (photos by M.M. Ștefan).

K 2. Amphorae – Dismantled dromos II sector. Find list P30. 2018 (Figure 189).
Wall fragments; decoration with parallel, irregular grooves or waved grooves.
Discovery context: S8; sq. 2; absolute elevation 45.60 m - 44.80 m; layer of Late Roman activity on top of the remains of the dismantled *dromos* II entrance.
Date: 5th-6th c. AD.

K 3. Amphorae – Dismantled dromos II sector. Find list P31. 2018 (not illustrated).
Wall fragments; various decoration: with parallel grooves, densely spaced or more distanced striations.
Discovery context: S8, sq. 1, in the filling of the modern ditch for the water pipe.
Date: 5th-6th c. AD.

K 4. Amphorae – Dismantled dromos II sector. Find list P18. 2018 (not illustrated).
Wall fragments; decoration with parallel grooves.
Discovery context: S8; sq. 1, vegetal layer, deposit altered by the 1993 excavations.
Date: 5th-6th c. AD.
L. Roman pottery (L 1-4)

L 1. Lid – Dismantled dromos II sector. Find list P30. 2918 (Figure 189).
Fragment; discoidal; with broken button; yellow fabric, whitish exterior.
Discovery context: S8; sq. 2; absolute elevation 45.60 m - 44.80 m, layer of Late Roman activity on top of the remains of the dismantled *dromos* II entrance.
Dimensions: diam. = 0.106 m.

L 2. Cooking pot – Dismantled dromos II sector. Find list P30. 2018 (Figure 189).
Fragment; body with bulging profile; projecting rim with groove towards interior (for lid support); handle fixed under the rim with two longitudinal grooves; brick-coloured fabric; traces of secondary burning.

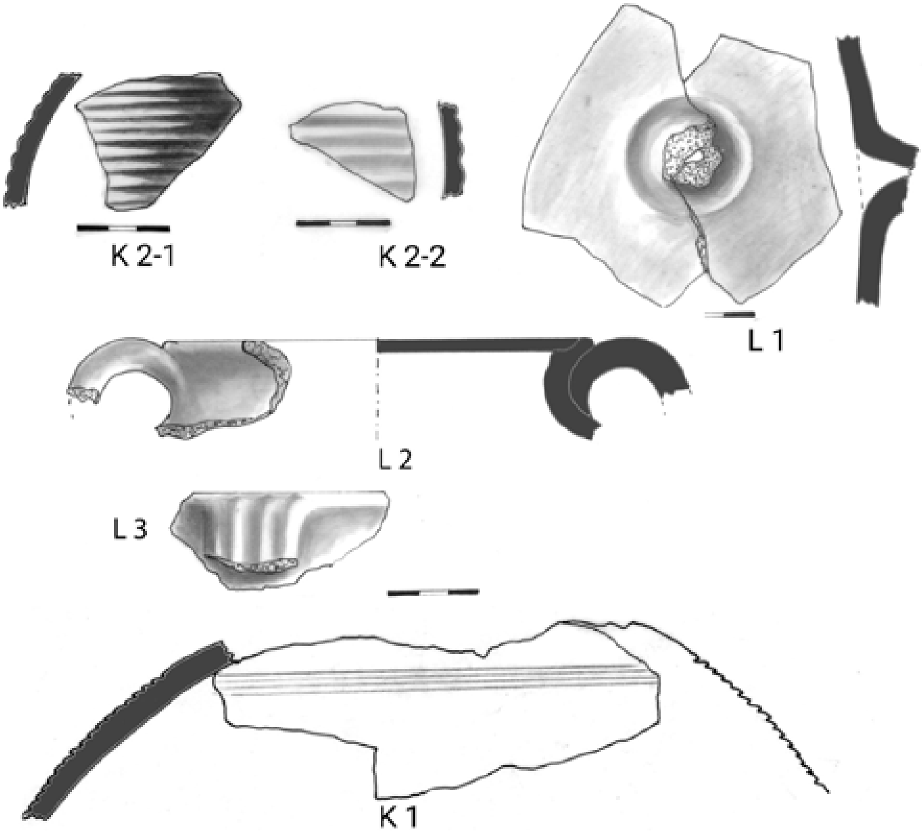


Figure 189. Late Roman pottery found at Documaci (K 1-2; L 1, L 3) (drawings by Fl. Marțiș).

Discovery context: S8; sq. 2; absolute elevation 45.60 m - 44.80 m, layer of Late Roman activity on top of the remains of the dismantled *dromos* II entrance.
Date: 5th-6th c. AD.

L 3. Cooking pot – Dismantled dromos II sector. Find list P36. 2018 (Figure 189).
Fragment of rim; handle stretched out of the rim; grooves on the rim.
Discovery context: S8; sq. 2; absolute elevation 45.60 m, a layer of Late Roman activity on top of the remains of the dismantled *dromos* II entrance.
Date: 5th-6th c. AD.

L 4. Cup or pitcher – Dismantled dromos II sector. Find list P36. 2018 (not illustrated).
Fragment; horizontal rim, thickened towards exterior; grooves under the rim.
Discovery context: S8; sq. 2; absolute elevation 45.60 m, layer of Late Roman activity on top of the remains of the dismantled *dromos* II entrance.
Date: 5th-6th c. AD.

Chapter 13
Small Finds

Maria-Magdalena Ștefan

Except for the pottery fragments detailed in the previous chapter, the excavations have revealed only a very few other types of finds. We can include in this category three metallic items, two found in our recent excavations (a fragmentary arrowhead and a bronze ring) and one originating from the earlier research of V. Georgescu (a gold finger-ring). Despite being few in number, their contribution to the chronological context seems significant and worthy of a dedicated discussion.

In addition to the gold ring, we know from Georgescu's report (Georgescu *et al.* 1996: 4) that he had also found a coin issued in Callatis – 'autonomous, beginning of the 3rd c. AD', however it remains unrecorded in the museum and thus impossible to describe here. It was reported as being found in SIII/1995 (see plan in Figure 59; 62), in 'square 13', near 'ring II' and at a depth of 1.60 m. Ring II has to be Z1, i.e. the *krepis* wall we also identified in S3/2017 (the trench in which we have partially reopened SIII/1995), paired with a 'ring I', which for the excavators might have represented the abutment wall Z11. It is not however clear what 'square 13' could have meant, as the entire SIII trench measured just 24 m. In any event, taking into consideration the stratigraphy as drawn by M. Ionescu in 1995 for SIII, and our own trench S3, this Roman-period coin was most probably found outside the *krepis* wall, in the deposit connected with the extensive ancient dismantling of the embankment and that particular area of the necropolis in general.

1. **Gold finger-ring** (Figure 190/a-b). Solid; cast; oval broad bezel (14 mm x 10 mm) with thickened rounded margins, continued with a wide hoop-band (flat on the interior, projecting on the exterior) in one piece; probably polished, decorated in the centre with the engraved image of a tortoise with spread feet, tail and head, seen from above. The diameter of the hoop is *c.* 15 mm. If approximated correctly, on the basis of the photograph, this is a very small size, probably for a woman's hand.

We have never seen the item, and all the observations and measurements were based on a single oblique photograph (with a scale) taken by M. Ionescu in 2006 and made available to us for study. Initially kept in the 'Callatis' Museum of Mangalia, with the inventory number 2575, the ring was stolen from the exhibition in 2016, together with other valuable ancient artifacts, and has been unaccounted for since.

On the shell of the tortoise one can perhaps make out the image of a crouched hare with arched back. The craftmanship is very fine. Many details were added despite the small dimensions: the toes on the turtle's feet, its eyes, and even the ears and tail of the hare. Several scratches can be also made out on the bezel, possibly traces of use-wear.

Context of discovery: Found by V. Georgescu during his work in the funerary chamber in 1993-1995. It is not entirely clear, however, but we assume that the ring was found in the sieved soil deposit (measuring about 1 m high), which accumulated on top of the broken floor after dismantling and the repeated looting of the tomb in the 5th-6th c. AD, as no trenches were then opened under the former floor levels.

Gold rings, sometimes interpreted as signet rings, were customary features of rich funerary inventories in Thrace, Macedonia and the northern Black Sea area, in both male and female burials, starting from the second half of the 5th c. BC and throughout the Hellenistic period. Some were engraved with names or with representations of various characters, deities, animals, portraits, while others remained undecorated. The oval, yet broad, smooth-edged shape of the Documaci ring bezel argues for a date in the second and third quarters of the 4th c. BC, similar to Boardman's category IX (1972: 213-214), but without angular shoulders, and definitely not type XI (with the large, round bezel), typical for the end of the 4th - beginning of the 3rd c. BC (Treister 2015: 146-148). Animals appear often on Greek rings of the Classical period, however tortoises are rare on Greek jewellery. A tortoise on a gold ring with oval bezel was discovered in the Sineva mound tomb, in the Shipka area of Bulgaria, together with a set of silver horse trappings, dated to the 4th c. BC. The turtle on the bezel was flanked by a bunch of grapes and the head of a griffin (Kitov 2003: 38, fig. 28).

The image of a turtle seen from above was a famous symbol, widely known throughout the Mediterranean, starting from the 6th c. BC; it is related with the coinage of Aegina – the first coin standard accepted at a supra-regional scale. After the end of the 5th c. BC, Aegina

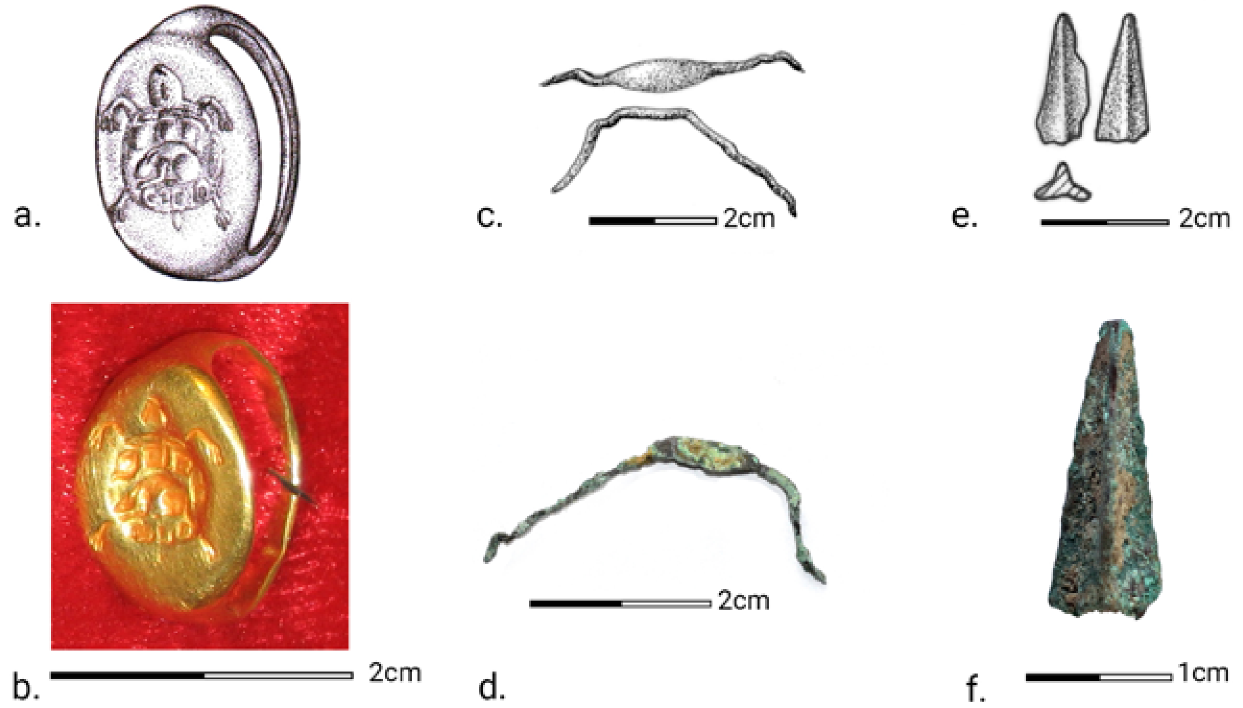


Figure 190. Small finds: a-b) gold ring found by V. Georgescu in his 1993-1995 excavations in the funerary chamber (photo by M. Ionescu, drawing after photography by Fl. Marțiș); c-d) bronze ring in C5A/S10; e-f) bronze, three-bladed arrowhead found in S1, in the dismantled *dromos II* northern wall area (drawings by Fl. Marțiș).

changed its iconography from a sea turtle to a land tortoise; however after the death of Philip II this type of coinage disappears.

In the case of Documaci, the association of a tortoise with a hare brings to mind Aesop's famous fable. The overconfident hare, stopping to take a nap in the middle of a race, loses in the end to its much slower opponent, the tortoise, who just kept on going. The story may have multiple meanings: i.e. good qualities do not always mean success unless wisely used; overconfidence may lead to underestimating an opponent; steady action is better than haste, and so on. The tortoise was also associated with Hermes, the inventor of the lyre, made from its shell. Hermes often appears in the funerary artistic representations of early Hellenistic Macedonia, as guide to the underworld.

This ring probably went unnoticed by the looters, lost in the debris of the dismantled sarcophagi. It gives a glimpse into the richness of the lost funerary inventory.

2. Bronze finger-ring (Figure 190/c-d). Hoop circular in section with a widened central segment in the shape of an elongated flat leaf (5 mm x 13 mm); unconnected; broken(?); preserved in its current condition to a length of 39 mm; thin and fragile, probably hammered. *Context of discovery*: Find list P.104. 2019. Trench S10, sq. 4; Pottery agglomeration C5A, absolute elevation 77.76 m, on the original vegetal layer, in the area dedicated to *enagismoi*, north-western sector of the mound; together with fragments of vessels.

It resembles the most popular finger-ring shape throughout the Classical period, with a stirrup-shaped and slim hoop, round in section, and a thin leaf-shaped bezel, originating from an Archaic type. By the end of the 4th c. BC, bezels become larger and circular compared to the small leaf shape of the preceding period, and the hoop heavier in contrast to the slim form (Boardman 1970: 212-213). Similar bronze finger-rings, although with engraved decoration, were found in Apollonia Pontica, within graves dated from the second to last quarter of the 4th c. BC (similar to types AII.2 and III at Chaceva 2017).

3. **Bronze arrowhead with three blades** (Figure 190/e-f). Tip fragment; broken sleeve; preserved height 20 mm; pyramidal shape; 4th c. BC (Meljukova 1964, 4th group).

Context of discovery: Find list P25. 2018. Trench S1, sq. 6, absolute elevation 43.60 m, in the upper part of the foundation ditch, between remains of plinths for the dismantled northern wall of *dromos* II. It is to be associated either with the building period, or, more probably, it should be considered a part of the looted original inventory. Georgescu (*et al.* 1996: 3) mentions a further two three-winged bronze arrowheads found during the excavations of 1993-1995, although it is not clear where. Considering that he also made excavations in the area of the current entrance to the *dromos* (exactly where we found the arrowhead) they could belong to the same context, suggesting the existence of a quiver in the original inventory, as was the case in the barrel-vaulted tomb researched near Pecineaga by M. Irimia in the 1970s (1983: 118-123, 1984: 64-83).

Chapter 14

Analysis of Faunal Remains Found in the Ritual Deposits of Documaci Tumulus

Adrian Bălășescu

The fauna of the Documaci mound originates from a series of archaeological structures identified inside the early 3rd c. BC tumulus, namely from features 5A, 5B and 6 – deposits of ceramic vessels and animal bones, researched in its western sector (see Chapters 5.4 for archaeological details and Chapter 12 for pottery). The fauna is not numerous as we analysed only 177 remains, weighing just 138 grams (Table 19). Even so, the assemblage remains extremely interesting, especially if we consider that such archaeological monuments – the tumuli – are extremely poorly researched from an archaeozoological point of view (Bălășescu *et al.* 2003).

Most of the studied faunal remains (number of remains/NR = 168 - 94.9%; weight = 68 g - 49.3%) were strongly burnt, resulting in severe fragmentation; only nine remains (5.1%; weight = 70 g - 50.7%) were not burned. The burning of the bones caused their sharp fragmentation and greatly influenced their degree of taxonomic determination. Thus, out of the 168 burned bone fragments, only six (3.6%) were taxonomically identified, while out of the nine unburned, only five could be determined specifically (55.5%). The degree of burning has resulted in significant bone colouration (white, grey, black, etc.), which sometimes suggests relatively different temperatures. The colour of burned faunal fragments can also be an indicator of the temperatures to which the bone was subjected, but within the spectrum the oxidizing or reducing conditions of combustion must also be considered, although often impossible to determine. Thus, shades of yellow-brown are given by temperatures between 200-260 °C, brown-black appears between 300-350°C, black-grey indicates temperatures *c.* 500 °C, while white-grey suggests 650-700 °C (Arnaud, Arnaud 1978).

Methodology

The anatomical and taxonomic determinations of mammals were performed in the Laboratory of Archaeozoology of the Romanian Academy Institute of Archaeology 'Vasile Pârvan'. The methodological works of Barone (1986) and Schmid (1972) were also consulted. We estimated the slaughter age of horses after dental wear (Fernandez, Legendre 2003). The correlation of biological data with zootechnical ones was made after Forest (1997).

Description of the fauna from the studied archaeological complexes

1. Archaeological feature 5B

1.1 *Find list P51-52. 2019. Trench S10, sq. 3, abs. elevation 44.85 m.* Seven unburned bone fragments were identified of which only three were taxonomically determined, the rest coming from medium-sized mammals being indeterminate. Thus, a superior tooth (P^2) on the right side (40 g) of a horse (*Equus caballus*) from an individual of about 6-8 years (Figure 191/a) and two left coxal remains (2 g) from an ovicaprine (*Ovis aries*/*Capra hircus*) over one year of skeletal age is probably a subadult/adult.

1.2 *Find list P53. 2019. Trench S10, sq. 3, abs. elevation 45.00 m.* Two bone remains of ovicaprine (*Ovis aries*/*Capra hircus*) were analysed, which were not burned, but which show the bone surface strongly degraded by the vegetal roots, making it difficult to visualize anthropogenic traces of skinning. Thus, two right diaphyseal remains were identified (Figure 191/c) , a femur (10 g), and a tibia (16 g) that probably came from a subadult/adult animal.

1.3 *Find list P58. 2019. Trench S10, sq. 5; abs. elevation 44.90 m.* Under the broken vessels in the northern area of the deposit 21 remains were identified of medium-sized mammals (5 g), which were strongly burnt to white; they were broken longitudinally, measuring less than 2 cm.

1.4 *Find list P64. 2019. Trench S10, sq. 3, abs. elevation 44.90 m.* 123 burnt bones were found under vessels deposited with their faces down and bases up, some broken on the spot; all the fragments were burned to different degrees (white, brown, black).

- Five remains, measuring <1 cm, belonged to a subadult/adult hare (*Lepus europaeus*): an epiphyseal scapula (burning grey), an epiphyseal proximal humerus (black-grey burning), one diaphysis of radius (white-brown burning) and two diaphyses of metapods (burnt to white) (Figure 191/b). The fragment of an ovicaprine sesamoid (*Ovis aries*/*Capra hircus*), burned white-grey (Figure 191/d). An indeterminate remnant

Figure 191. Animal bones identified in Documaci ritual deposits (photos by Cătălin Nicolae).

(<2 cm) of a large mammal. An indeterminate fragment (*c.* 6 cm) of a medium-sized mammal.
- 115 indeterminate remains of medium-sized mammals <2 cm.

All indeterminate remains were strongly burned to white.

2. Archaeological feature 5A

2.1 *Find list P104. 2019. Trench S10, sq. 4 (southern half), 44.78-44.70 m.* Six strongly burned white bone fragments were discovered from large mammals, five of which are <2 cm (4 g), and one between 2 cm - 5 cm (3 g).

3. Archaeological feature 6

3.1 *Find list P109. 2019. Trench S11, sq. 4.* On and between the stones representing the rubble of wall Z9, abs. elev. 45.09 m - 45.17 m, 18 indeterminate remains burned to white; they belong to medium-sized mammals. Of these, two measure between 2 cm - 5 cm (7 g), and 16 being <2 cm (10 g).

Table 19 Numerical distribution (no) and weight (w) of faunal remains identified at Documaci mound.

NR - Species/archaeological context	**P51-52**	**P53**	**P58**	**P64**	**P104**	**P109**	**Total**
Equus caballus	1						1
Ovis aries/Capra hircus	2	2		1			5
Lepus europaeus				5			5
Determined mammals total	3	2	0	6	0	0	11
Undetermined large sized				1	6		7
Undetermined medium sized	4		21	116		18	159
Total mammals	7	2	21	123	6	18	177
Burnt			x	x	x	x	
W - Species/archaeological context	P51-52	P53	P58	P64	P104	P109	Total
Equus caballus	40						40
Ovis aries/Capra hircus	2	26		1			29
Lepus europaeus				4			4
Determined mammals total large sized	42	26	0	5	0	0	73
Undetermined large				2	7		9
Undetermined medium sized	2		5	32		17	56
Total mammals	44	26	5	39	7	17	138
Burnt			x	x	x	x	

Conclusions

Only three species of mammals were identified in the faunal material, two domestic (horse and ovicaprine) and one wild (hare). The remain of the horse was not burned (P51-52), the hare fragments were all burnt (P64), while some of the ovicaprine remains were found both burned (P64) and unburned (P51-52 and P53).

From an anatomical point of view, the rest of the unburned horse comes from the skull area, which does not have such a high food potential. With ovicaprines, and also the hare, the remains come from areas rich in meat, such as the hind or front limbs. In the case of the latter two species, we might consider them either the remains of some animal offerings (ovicaprine), or of a funeral banquet (the hare).

The horse, on the other hand, has a different position in the funerary contexts of the La Tène period, being perceived as linked to warrior classes, with the species playing an important role in the ceremonies dedicated by aristocratic groups to their dead (Sîrbu 1993: 108).

Concluding Remarks

Valeriu Sîrbu, Maria-Magdalena Ștefan, Dan Ștefan

The Documaci Tumulus was an impressive funerary monument of the early Hellenistic period, not only judged at the scale of the Callatian necropolis, but by its exquisite architectural coherence it may be placed alongside other pre-eminent tombs of elites, originating from, or just connected with, the Macedonian milieu in the era of the Diadochi, be they from northern Greece or Asia Minor.

Measuring 52.8 m in diameter, it could have topped at least 9 m, to which the height of an exposed sizeable stone or marble monument must be added as well. At this scale, and occupying the highest location on the western horizon of Callatis city, it was a definitive visual marker of the region, especially for travellers approaching by sea. The choice of location announces already an assumed programme of its commissioners for individuality and pre-eminence, at the margin of the city's funerary plots, but not outside, in a specifically emphasised position, augmented by its inter-visibility. This gives a tension with the city and its environs, a declaration of both independence and belonging, with the topped monument as mediator.

Prepared in advance by its future occupants with the involvement of specialized architect(s) and painters of possible Amphipolitan origin, it was designed to function as a tomb complex for a very rich family, who, even if in close relation with the Callatis community, broke with its funerary rules of standardized citizenship representation. The architectural and artistic models to which the monument referred to can be recognized in those tombs developed after the middle of the 4th c. BC around the cities governed by Macedonian elites, many of a military origin, or by their political associates. Therefore, in addition to being a spontaneous fashion, a declaration of richness and economic potential, this particular type of tomb, with barrel vaults, dressed quadrae, painted and plastered interiors and marble *klinai*, taken in the context of a Greek polis, has to be seen first as a political declaration. Certain afterlife beliefs involving the concept of the tomb as a house and the need for its periodic visitation may justify it, but always in connection with a political element, especially in a period when the democratic regimes of the *poleis* clashed with the rule of Macedonian garrisons, or with the royalist tendencies of their local supporters.

Great emphasis in the funerary design at Documaci was placed on the commemorative component. Not only did the monument include a heavy stone marker on top that induced cracks and deformations in the massive foundation socle, but an entire monumental area dedicated to offerings, featuring a walled inner courtyard of *c.* 70 m^2 and a large altar adjacent to the *krepis*. These constructive elements, with commemorative and ritual scope, and even their favoured orientation towards the west, are in a way just a scaled-up variant of similar structures found in several other places within the Callatian cemetery, especially in the northern plots – where state burials were most likely granted.[1] These elements of ritual show that the family buried at Documaci followed a Callatian practice of commemoration, and on a larger scale – a Pontic one – with analogies at Panskoye, in the territory of Chersonesos (Stolba, Rogov 2012), and so did their kin who continued to visit the tomb and offer gifts. These facts are essential when judging the identity of the commissioners. While the traditional historiography opted to interpret differences in funerary architecture in terms of ethnicity, the only identity elements that archaeological analysis in this case may point to are: the belonging of the Documaci commissioners and their families to the Callatian ritual community, their ties with the political factions supporting Macedonian interest, and a consistent economic capacity. Even if from the initial inventory almost nothing survived, we can get an impression of the high costs just by looking at the scale of the project, the quality of the design, made by a person who had to be an esteemed and experienced architect, the quality of the stones and plasterwork, the purchase of the two large and expensive marble *kline*-sarcophagi, and the gold ring.

The records of another four chamber tombs of similar type around Callatis[2] sustain the existence of a group of people living in the Callatian territory who shared these political and social values. A series of five other barrel-vaulted chamber tombs of the same date is known from Odessus (Damyanov 2010), a city in a similar political relation with the Macedonian kingdoms during the wars of the Diadochi.[3] Such tombs have been revealed on the outskirts of many other Greek cities throughout the Hellenic *koinè*, not only in territories controlled by Scythians or Thracians, but by Macedonian garrisons. If a single parallel is required, we need look no further than the so-called *Tomb of Erotes*, on the island of Euboea,

[1] see Chapter 3. Broader Context: Burial Grounds at Callatis.
[2] see Chapter 3. Broader Context: A group of Hellenistic period chamber-tombs in Callatis Challenging ancient identities.
[3] see Chapter 3. Broader Context: Callatis in the 4th-3rd c. BC. A political player on a secondary stage of the Diadochi wars

close to Attica, where a chamber tomb with *dromos* covered by a large mound, topped by a monument placed on a socle, supported with abutment walls, was found (Vollmöller 1901). This family tomb was used for several generations, each deceased having their name inscribed on the marble *klinai*, or on the marble thrones used as sarcophagi. These names imply a Macedonian origin for the deceased. The monument's latest publisher, Caroline Huguenot (2018), considers the tomb as belonging to a family of high dignitaries from the town of Eretria, some of whom could have been members of the Macedonian garrison taking charge of the city in the second quarter of the 3rd c. BC.

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On a smaller scale, focussing on the features, the current research has looked at several aspects regarding: (I) the building of the monument, (II) its chronology, (III) main analogies, and (IV) destruction and secondary use.

I. The Documaci Mound was a one-time project built to a careful and pre-established design, in which the main structural components – tomb with *dromos*, socle for a central monument, surrounding stone wall, exterior altar, exterior pavement and area for offerings – were referenced to each other, in terms of composition, symbolism, and function. Our investigations disclosed much of the concept of the architectural project, which, once revealed, also exposed certain deviations from the basic plan that happened during implementation. It should be noted, however, that not all the elements can be explained and there is still scope for future excavations. The following conclusions should be regarded, therefore, within the framework of the current state of research.

Even if the hypothesis of a two-phased tomb construction were taken into consideration in the early stage of our investigation, starting from differences in the execution of the *dromos* and clues for a pit in which the socle was fitted, once the data was accumulated it became clear that these factors are not the results of different building phases, but different stages in a *chaîne opératoire*.

A. The first category of arguments is related to the stratigraphy. Analysis of older documentation, corroborated by new digs and geophysical studies, helped in painting a clearer picture:

1. The stratigraphy of the main profile, located south and parallel to the tomb, documented in 1993 by Georgescu's team and drawn by M. Ionescu (Figures 59-60; 63), shows that the monticules built 2.5 m - 3 m south of the *dromos* were raised at one time along the entire corridor's length. No limit between an embankment corresponding to *dromos I* and another to *dromos* II could be observed in this profile. By contrast, the difference in stratigraphy manifested along the embankment's height, not its width, with the lower layers deposited up to the height of the vaults - heaped in the same time with each row of carved blocks added in the construction, in a thin, alternating style, and with thicker, longer, and more uniform looking layers added on top of the vaults, once the stonework for the tomb was finished. The thin layers corresponded with the need for stability for the soil rampart, while the wider clay layers ensured the waterproofing of the stone structure.
2. The stratigraphy for the embankment, located immediately to the south (Figure 63) and north (Figure 62) of the funerary chamber and *dromos I*, suggests that the thick layer of red loess which covered the vaults of the funerary chamber and *dromos I* was: 2a) covering a thick layer of yellow loess deposited above the roof of *dromos* II (added later than the covering for *dromos* II), and 2b) were assembled from the base of the tumulus up, as part of a monticule that also included the layers associated with the chamber construction.
3. The stratigraphy of the embankment to the north of *dromos I* shows that the monticule built at the same time with the corridor walls was also contemporaneous with the retaining wall (Z12) bordering this monticule, a retaining wall which was part of the same structure (as the geophysical data showed) as the retaining walls (Z11, Z14) bordering the northern embankment, built at the same time as the socle. Therefore, the socle and *dromos I* are stratigraphically connected within the framework of the walled frame in which the mound was heaped (Figures 9; 59; 65).
4. The initial construction level was completed in a uniform manner under the entire embankment, as a foundation, by scraping away the original soil and partially replacing it with dark clay, followed by compacting the soil. Even if a ramp incline can be recognized in the newly obtained terrain, it remains clear that efforts were made to reduce the original sloping topography. The fitting of a 'zero level' also helped in constructing the slightly sloping *dromos*, disguising the chamber's foundations.
5. The walls of *dromos* II were built interlinked with lateral retaining walls and layers of stones – a part of the monticules assembled from the same zero-level upwards. These lateral monticules were symmetrically placed in relation to the corridor (Figures 68-71).

6. Retaining walls were also included in the embankment that was raised near the funerary chamber (Figure 64).

B. The second category of findings refers to the interconnected spatial organisation of the funerary elements. Spatial integration of data and geophysical surveys allowed these conclusions. The socle centre corresponds with the centre of the ideal circle fitting with the exterior pavement encircling the mound. The centre of the ideal circle for the *krepis* is just 60 cm to the east of the socle centre. The sides of the socle and funerary chamber are parallel. The southern sides of the socle and funerary chamber were built along a unique axis, that also goes very close to the centre of the walled courtyard in the north-west, where ritual offerings were deposited. The walled courtyard for offerings and the entrance to the tomb are practically opposite ends of the same axis.

C. The third category of evidence concerns the use of the same measuring unit – the Hellenistic foot of 0.332 m – and the clever play of proportions between the elements. The socle is a scaled-up version of the funerary chamber by a value very close to the golden ratio (1.6). The ratio between the funerary chamber sides is 1.2; the ratio between the chamber vault diameter and the vault of *dromos* I is 2.25, while the ratio between the chamber long sides and *dromos I* length is 1.25. *Dromos* II length is three times that of *dromos I*, while the entire tomb length, including the width of the walls, is 1.2 of the ideal circle radius (or smaller radius of the ideal ellipse). The height of the *kline* is 1.6 of the height of the coloured walls, while their lengths are exactly the radius of the circle of the funerary chamber *extrados*. The doorway frames exactly half of the main *kline*, in the area of the deceased's head. This proves extensive planning and a preparation phase before the first stone was even laid.

D. The fourth category of data may be labelled as details of execution. This refers to the fastening system of the two sectors of the *dromos*, which was obviously predesigned with blocks cut in such a way as to ensure a tight fitting shaped in steps of the two walls (Figure 128). We may also mention here the use of common plinths for the two sectors, on the southern wall, and of the same initial terrain levelling, with black, beaten soil. The deviation of the longitudinal axis towards the north, thought by the first team to only characterize *dromos* II, was proved to be in part also visible in *dromos I* (Figure 125). Both sectors of the *dromos* were built sloping, gradually diminishing the elevation difference between the walking level in the funerary chamber and the exterior pavement in the east (Figures 126-130).

All these elements sustain the unitary construction of the ensemble. The cutting of the embankment for fixing certain stone structures, i.e. the eastern side of the socle in the mantle supporting the funerary chamber, or the insertion of *dromos* II walls in pre-heaped monticules, should be explained as building stages in a chain of operations, not phases of use and burial.

Deviating from the architectural project's apparent logic, we have the change of direction along the entire *dromos* and the eccentric position of the south-eastern segment of the *krepis*. If the latter can be explained by considering the mound as an ellipse and not a circle, the deviation of the *dromos* – by *c.* 13 cm – remains for the moment an issue. A construction error cannot be ruled out, even if it seems surprising considering the rest of the obvious minute attention paid to centimetric details. Some building faults can also be observed in the rendering of the *dromos I* vault at its eastern end, where the keystone was not placed in an exact central position.

II. Chronology

When discussing chronology we are aware that artifacts or elements of construction and decoration may refer to different moments in the life of the monument, i.e. date of construction, date of the burial(s) or period of practising commemoration rituals at the grave for a certain subsequent period after the burial. In addition, we must also take into consideration that a monumental construction had the potential to attract attention for a longer interval, in part in direct relation with the owner, but mostly not. Some of the finds from this site belong to the long chronology of its destruction and secondary use.

The oldest finds in the Documaci ensemble are the two finger-rings (see Chapter 13). The gold ring (Figure 190/a-b) with oval broad bezel, decorated with the carved image of a tortoise on which a hare sits, found in 1990s by Georgescu in the funerary chamber, among the debris of the ancient looting, has analogies before the last quarter of the 4th c. BC, a period after which the fashionable gold rings of the Pontic area became round and flat (type XI in Boardman 1972). The thin bronze finger-ring (Figure 190/c-d) with a leaf-shaped bezel, part of the ritual deposit C5A, has analogies in Apollonia Pontica, dated between the second and last quarters of the 4th c. BC (Chaceva 2017). The finger-rings are nevertheless a common category of heirlooms for tombs; the gold ring, for example, had traces of use on the bezel, so they date the life of those who gifted them, not the burials.

The fragments of sculpted and painted marbles (Figures 117-119), parts of the destroyed *klinai*, also have rather early analogies – in tombs of eastern Macedonia dated *c.* 300 BC (Sismanidis 1997: 23-60, 123-126). This might set a credible date for the building of the tomb, certainly at some time before the burial(s) proper. The restrained and symmetrical painting schema, in the so-called 'masonry style', imitating the stone decoration of houses, does not contradict this chronology. Tomb IV at Amphipolis, with its many similarities to Documaci in terms of construction details, is also dated to the end of the 4th c. BC (Perdrizet 1898).

A fragment of an amphora (cat. A 13), a product of a north Aegean centre, not later than the 4th c. BC, was found in the original vegetal layer that was left untouched in the western sector of the mound, thus a little before, or just at the time the construction project started. Two fragments of amphorae, one from Heraclea Pontica (cat. A 5), the other from Thasos (cat. A 4), were found scattered in secondary contexts – the first under the debris of the walled courtyard (in trench S7) and the other in S8, among the remains of the dismantled *dromos* II entrance. They belong to the period between the end of the 4th - first quarter of the 3rd c. BC. They might have been part of the earliest deposits, or remains of the construction period. Fragments of *lekanides* (cat. E 1-2), also with analogies in the late 4th - early 3rd c. BC, were found in the eastern part of the embankment, one *in situ* and one in a secondary context, with material scattered during the Late Roman looting, but assumingly part of the initial embankment in the entrance area. The bottom of a Chersonesos amphora (cat. A 1) found in the embankment layers relating to the building of the southern wall of *dromos* II was also placed between the last quarter of the 4th - mid 3rd c. BC.

The majority of datable material available to this point comes from three ritual deposits partially researched

Table 20 Chronological elements for establishing the construction date and for framing the subsequent interval of practicing commemorating rituals at the grave, according to dates discussed in Chapters 12 and 13.

Cat.	Item	400		350		300		250		200	
A 1	Chersonesos										East - embankment - *in situ*
A 2	Chersonesos										
E 2	*Lekanis*										
A 4	Thasos										East - dismantling of the entrance area
E 1	*Lekanis*										
A 3	Sinope										
13.1	Gold ring										dismantled chamber
	Kline										
C 1	Palmettes										West Deposit C5B
G 2	*Kantharos*										
G 1	*Unguentarium*										
G 3	*Guttus*										
13.2	Bronze ring										West Deposit C5A
A 11	Ikos										initial humus
A 10	Sinope										West - above the ritual area; piled in time; repeated offerings; debris
A 12	Sinope										
A 5	Heraclea										
A 9	Rhodos										
A 8	Sinope										
A 7	Sinope										
A 6	Sinope										*Passim*

in the north-western sector of the mound, in the sector of the walled courtyard. They contained small and fine vessels for serving food, or for drinking, but also oil containers, some black-glazed. Some vessels were broken on the spot and spread around, others were presumably placed entire, but were destroyed by the weight of the soil and stones fallen from the lateral abutment walls of the courtyard. Burnt bones of goats and hare were found under them (see Chapter 14). A fragment of a horse skull, unburnt, was also found amongst the pottery fragments of C5B. These deposits are the remains of food, drink and oil offerings (*enagismoi*) made at the grave, on the occasion of the burial/burials, or at some later celebration at certain holidays honouring the dead. Pyres or fireplaces were commonly found in association with this type of deposit in other Pontic or Macedonian necropoleis; as our excavation was very limited in this area, these might appear in the future. From an area measuring *c.* 70 m^2, we only excavated less than 10 m^2, so there is still more to be found out, including about their chronology. One of their features is that they do not seem perfectly closed contexts. They were probably made on the soil surface, possibly under a light roof, and left as such to the elements. Repeated reuse of the place for offerings could mix materials of various dates. In the soil layer covering these deposits there were found numerous amphorae fragments ranging from as early as the second quarter of the 4th c. BC (A 8), first third of the 3rd c. BC (A 10), or the latest in the second quarter of the 3rd c. BC (A 9).

The overall chronological value of the discovered vessels here is first that they show the latest possible date for the burial, and second, especially the amphorae in the top layer, that they might reveal the length of time the family/community visited the tomb and paid their respects to the dead. Taken individually, the materials reviewed so far from the three deposits have analogies in a wider period, from the end of the 4th - third quarter of the 3rd c. BC. Nevertheless, the clear association inside the same undisturbed deposit of an *askos* of the *guttus* type (cat. G 3) with an *unguentarium* (cat. G 1), a black-glazed bowl decorated with stamped unconnected palmettes and rouletting (cat. C 1), and a black-glazed bowl-kantharos with flared mouth and loop double handles, painted under the rim with ivy leaves (cat. G 1), correspond better with the interval of the first decades of the 3rd c. BC – *a post-quem non* for the burial and construction project. Especially the *kantharos*, dated by Rotroff (1997: types 134 and 135) as 285-275 BC, is a very fine and fragile vase of a type that is hard to keep entire for long times, can be expected to provide the narrowest timeframe.

How does Documaci Mound relate, then, with the larger historical background known from written sources? The funerary project at Documaci has a political dimension and cannot be interpreted outside the picture of Macedonian involvement in the local politics of the *polis*. It was the kind of project that demanded significant resources and a period of relative stability to allow its building. It seems appropriate that a family could have been rich and powerful enough within a political network with Macedonian connections, once the harsh years of both Callatian wars with Lysimachus had ended, but before his death. If a parallel should be made, the reconstructive-revisionist activity of Cassander, following a period of wars is one to consider as potentially analogous for Lysimachus, too, as it led to a phase of intense construction and artistic development; many monuments were then built, some with commemorative purposes, i.e. at Amphipolis or Thebes. Perhaps Callatis also benefited from restoration after the wars, with funding from Lysimachus. The first decades of the 3rd c. BC were presumably the years of the wars between Lysimachus and Dromichaetes, in which Istros was on the side of the Getic ruler. Documaci seems to suggest that, meanwhile, Callatis was under the rule of a Macedonian garrison, with high-ranking officials delivering ostentatious messages through their monumental statues. Ritual activity at the grave continued for about fifty more years, meaning that the family continued to live in Callatis and had resources. By the end of the 3rd c. BC, Callatis was already experiencing great difficulties, abandoning their fortifications and with a reduction in urban area,[4] associated with a clear interruption in the use of its burial grounds as well.

Taken overall, we date the construction of the tomb as most probably in the first decades of the 3rd c. BC. Offerings made at the grave, especially the amphorae, suggest longer commemorative activity, lasting at least until the middle of the 3rd c. BC (or perhaps a decade or two later). Two fragments of stamped amphorae, one as *passim* (cat. A 6), the other in the debris of the altar adjacent to the *krepis* in the west (cat. A 7), were dated at the end of the 3rd c. BC, or even early 2nd c. BC. They might evidence the very latest offering on the site. However, their find contexts, as *passim* or in the open area of the altar, near the road, could also simply mean prolonged activity in that particular area of the necropolis.

III. Main architectural and constructive analogies

The monumental funerary constructions were more likely than other types of buildings to have been highly individualistic creations, where variety and liberty in mixing styles were even sought after. This is particularly true for the early Hellenistic period, which

[4] see Chapter 3. Broader context: Landmarks of the urban zone Callatis: fortifications, sacred areas, and harbour

witnessed a real revolution in mixing artistic trends, while emphasizing the image of their high-ranking commissioners as individuals of a heroic nature. Despite this, some fashionable trends in funerary design may be recognized, especially since it seems that certain monuments became famous sources of inspiration, both as physical creations and through their contained symbolism. Such connections show the existence of building schools, the mobility of masons and architects, and their acquaintance with a certain corpus of common aesthetic ideals.

The chamber-tomb found at Documaci belongs to the so-called 'Macedonian type', implementing true arches and barrel vaults[5] – the two emblematic architectural innovations of the early Hellenistic period, initially emerging around the cities ruled by Macedonian elites, e.g. Aigai (Vergina). The closest analogies for Documaci are to be found in the other four chamber-tombs known in the area of Callatis, in the contemporaneous small series from Odessus, but, above all, at Amphipolis, in eastern Macedonia, where several tombs under tumuli had *dromoi* descending with small slopes and no facades. The building system based on using common corner blocks for adjoining walls, placed on alternating courses, evidenced in the eastern wall of the funerary chamber of Documaci, where it was linked with *dromos I*, is also attested in the structure of tomb IV at Amphipolis. In the same tomb we can find the wall slits in which the marble slabs making the lids for sarcophagi were fitted. Another use of grooves of this kind, carved into the walls, is documented at Nea Kerdyllia tomb II, also in eastern Macedonia, close to Amphipolis. The closest analogies for the *klinai* marble decorations are to be found at Serres and Nea Potideea, again in eastern Macedonia. All these details, as well as the general resemblance between the socle in Documaci with the one built on top of Kastas, both assembled simultaneously with an embankment, make us consider as quite probable the hypothesis that the architect working in Callatis had ties with the Amphipolitan building school.

The quality of the plaster work, applied in three layers, the mixing of marble powder for lustre,[6] the painting on a previously applied colour undercoat, the use of tetrachromy principles,[7] are all proof that the painter was also experienced, mastering the most highly esteemed techniques of the day, as detailed by Pliny (*Natural History* 36.55-44).

The main difference in the design of the Documaci tomb from traditional Macedonian models is that the structure was built on the ancient terrain, raised at the same time as the embankment in layers of soil that correspond to each added stone course. The tomb was not placed in a pit and the access was made at a close level with the exterior. The features of the local geology could justify these differences. Even if minor, a certain sloping of the *dromos* is surely present, and carefully implemented in a gradual composition, while the ancient construction level preserved a 1 m difference between the entrance in the tomb and the western sector of the mound – where ritual activities took place – so a sense 'of descending' was clearly intended, and well suited to the local topography. The gradual sloping of the ashlars rows in the *dromos* have parallels with the tomb found outside Odessus, at the site now of the monument dedicated to the Hungarian-Polish king Vladislav Varnenchik (Mirchev 1958: fig. 3). Here also a certain deviation in the corridor was noticed.

The construction elements characterizing the assembly of the gable roof for *dromos* II – the V-shaped longitudinal grooves carved in the upper part of the walls and the special carving of the slabs to fit in the middle – can be very clearly matched with techniques used specifically in Olbia in the second half of the 4th - 3rd c. BC (Figure 132). This might suggest that the commissioners could have hired several contractors of different origin to work on the construction site. Different hands can be observed in the masonry work done for the *krepis* as well.

In what regards the general concept of the ensemble, we notice certain similarities with the *Tomb of Erotes* in Eretria (central monument, supporting walls in the embankment), Kastas at Amphipolis (central socle for a topping monument, *krepis* wall, a diameter which is apparently three times larger than that of Documaci, suggesting the use of a similar measuring unit), and Ygma Tepe of Pergamon (*krepis*, again a diameter three times larger than Documaci). The funerary complex at Kastas, perhaps the most impressive of the Macedonian-type tombs ever excavated, is still awaiting publication, but preliminary data advanced by its excavators place it in the last quarter of the 4th c. BC (Peristeri 2016). The *Tomb of Erotes* (Hugenot 2018) was used during the second quarter of the 3rd c. BC and is thought to have been built for high-ranking dignitaries, presumably members of the Macedonian garrison active on the island.

[5] The semi-cylindrical vault built of carved stone blocks, so as to give them an arched shape, is an advanced technical solution that solves the pressure exerted by the weight of the mound on the roof. The pressure is released by this arch towards the walls, which, in turn, were supported from the side by the earth mantle that held the whole construction together (Ștefan 2012). Such a roof would have made it possible to cover wider openings than a flat roof.

[6] see Chapter 9. Plasters and Pigments: Mineralogical Study of plasters and pigments

[7] see Chapter 9. Plasters and pigments: The painted decoration of Documaci tomb on the background of the wider early Hellenistic funerary artistic trends

Good parallels for the overall concept can be seen at Staro Bonce, in the tomb of Pavlo Cuka (Lilchikj *et al.* 2015), in the Republic of North Macedonia, in the Selecka Mountain range of north-eastern Pelagonia. Here a Macedonian-type tomb dug in the native rock, fitted with an antechamber and *dromos* (also covered with a semi-cylindrical vault) was covered by a mound and surrounded by a wall (diameter = 32 m), built of a single row of massive, dressed stones placed on a stone step and covered with a stone *geyson*. The *dromos* partially extended outside the enclosure wall. On the eastern side of the entrance a rectangular structure made of stones of similar style as the wall was built adjacent to the enclosure. It has been violently destroyed since antiquity. The ensemble is dated at the end of the 4th - early 3rd c. BC, on architectural style grounds only.

The consistent length of the Documaci corridor (17.8 m) is only 2.2 m smaller than the gable roofed corridor of Mezek Mal Tepe – a famous monumental funerary ensemble in southern Thrace (Filov 1937), fitted with a *krepis* built of dressed stones and featuring a tholos funerary chamber. The tomb was probably also built in the first quarter of the 3rd c. BC (Tzochev 2014). From the tombs in northern Greece, the 'Heuzey Tomb', datable to the late 4th - early 3rd c. BC, has a long corridor – sloping and barrel vaulted, measuring 11 m in length.

Apart from the beautiful mathematical organisation of the funerary space, two features in particular set the Documaci mound apart as a great engineering creation of the Hellenistic era: (1) the use of an extended network of rectangular chambers built of dry-stone walls meant to support a large embankment, and (2) the construction of a socle for a statue, from the base to the top of the mound, again at one with the surrounding soil mantle. These two features demonstrate the extensive geotechnical knowledge of the ancient builders in terms of structures, foundations, and soil behaviour.

Even if individual oblique abutment walls under tumuli embankments have been previously attested at several sites in Macedonia and Thrace, e.g. Archontiko Pella (Chrysostomou 1987), Sboryanovo (Fehrer 1935) and Muglizh (Archibald 1998: 293), the best analogy for the rectangular walled structures comes from Megali Toumba, Vergina – the huge mound erected over a group of princely tombs, including the so-called tomb of Philip II, presumably after Aigai had been pillaged by Celts, at the end of the first quarter of the 3rd c. BC.

The technique recognized at Documaci combines rubble walls with sloping bases, built here and there in the plan of construction monticules, to strengthen the overall connection between mantle and tomb, with rectangular stone structures, inside which the soil was heaped in defined zones and well beaten. In particular, such walls delimited those parts of the embankment that were built at the same time as the socle and tomb, on each side. The best-preserved wall (Z4 in S2) measured 2.3 m in height and 71cm - 75 cm in width.

The socle was built of massive ashlars carved only on the contact faces and along their corners for the vertical. The rest of the blocks remained as they were found in the quarry, proving that the structure had been designed to stay unseen in the ground. The stratigraphic data, available for the strata on the socle's north side, indicate also that soil was heaped laterally, like a ramp, once every one or two courses of stones had been added to the construction. The sequence was marked by fine layers of stone debris alternating with beaten soil layers.

Geological analysis[8] of the stones used to build the socle has documented that despite the careful selection of the most compact stones for the corners, the huge weight of the supported monument induced strong alterations in the foundation structure, manifested as cracks and splits, and also in the eventual collapse of the central part of the courses. The mapping of the cracks suggests that the monument had two weight centres – the heavier one in the west and the other to the east.

The monument was probably the first to disappear, the stone structure of the socle remaining for centuries an attraction for various visitors. The petrographic studies indicate that even if the majority of the stone alteration happened in the quarry, some should be attributed to its historic state of ruin, periodically exposed and dismantled, either as a source of dimensioned stone or in the search for valuables. Our excavations in the western part of the socle proved that almost 2 m of the current top embankment represents soil in secondary position, connected with systematic dismantling activity focused on the socle. It could be the result of Turkish activities in the 19th c., or perhaps the spoil of an undocumented exploration of Sauciuc-Săveanu in the Interwar period.

Now preserved to just 5 m in height, it must have topped at least 9 m in its original state, meaning a volume of 270 m^3 of stone and beaten soil, and more than 760 tons of limestone.

IV. Destructions and secondary use

The greater part of Documaci's story is, unfortunately, one linked to sorry sequences of destruction and neglect. Traces of secondary interventions can be seen in several parts of the tomb. In two cases, a series can

[8] in Chapter 7. *Sema*: Geologic features of the central socle for a monument topping Documaci tumulus

be recognized. It remains however difficult to link the events in the various parts of the tomb, due to lack of stratigraphic connection. One of the lootings in the funerary chamber, presumably the first, was absolutely devastating. The *klinai* were ripped off from their wall fixings with crowbars, and the decorative marble plates were smashed in minute pieces. Fire seems also to have played its part, as suggested by traces on the marble and doorway. The stone floors in the chamber and *dromos I* were likewise ripped up and the soil underneath the chamber excavated for at least 50 cm. Parts of the northern chamber wall, above Bed 2, were also broken. Traces of a systematic hammering of the plasterwork in search of empty spaces can also be seen. The looters took their time to collect all the goods and search in all the places they knew graves might be hidden – in wall niches and under the floors. When did this happen? It is difficult to say, however, already by the 5th-6th c. AD, the looted tomb, with a partially dismantled entrance, was systematically used for habitation (or other type of unidentifiable activity). Over the remains of the initial devastation, soil accumulated, as high as 1.2 m, containing numerous fragments of Late Roman cups with grooved parallel stripes (of a funerary use), and also amphorae and other kitchen vessels. The quantity of pottery is large enough to indicate the site's fairly lengthy period of use. Some of the pottery, of course, could have reached inside the monument, with the soil sloping down the dismantled entrance. Two superimposed walking levels, made of pebbles, were identified in the interior space of the dismantled *dromos* II, in S1 and S8, attesting a systematic use of the place. The various blocks still visible in *dromos* II on top of the secondary deposit of soil should also be linked with this later arrangement of the space, during the 5th-6th c. AD. The layers of pebbles arranged as floors, associated with Late Roman pottery, were overlapping the ashlars of the *dromos* II southern wall, meaning that by then it was ponly in part dismantled, because this primitive floor mostly respected the interior space defined by the walls of *dromos* II. A later dismantling targeted finally the last remaining stones along the walls in the entrance area, removing them completely, down to the foundation ditches.

A much later looting pit, dug from above (Feature 4 in S9), cut though the layer containing the Late Roman material from the funerary chamber, pushing back the threshold block.

Two further interventions were noticed in the western margin of the northern wall of *dromos* II, where some ashlars were removed from inside, while the first slab of the gable roof was found taken off outside – signalling one of the breaking-in places.

The tomb was occupied again sometime during the 10th c. AD, by people completing religious pilgrimages, a widespread phenomenon at that time in southern Dobruja (see Chapter 11). Ships of northern style, probably seen in the nearby port, horsemen with banners, and wild animals were naively scratched, although in a symmetrical and probably symbolic compositional arrangement, on the plastered walls of *dromos I*. The tomb, even if by then already looted and ruined, still attracted people and probably induced in them a sort of spiritual ease, while the white plasterwork must have reminded them of the soft limestone texture of the rock shelters and caves commonly used at that time as monastic shelters and churches.

Finally, it is the hope of the authors that these contributions have revealed at least some of the value of the Documaci Mound site as a whole, not only for its Hellenistic funerary archaeology, but also as a metaphor for the long and restless history of the western Black Sea region and its antiquities, always in transition between a state of ruin and a source of never-ending fascination.

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A Monumental Hellenistic Funerary Ensemble at Callatis on the Western Black Sea presents one of the most spectacular early Hellenistic funerary monuments, recently excavated on the western Black Sea coast by a Romanian-Bulgarian-Polish interdisciplinary research team. Documaci Tumulus, covering a painted tomb, and marked by a monumental statue, was built at the threshold of the 4th to 3rd centuries BC in the cemetery of the Greek City of Callatis. The sophisticated construction techniques and the remains of commemorative rituals attest to the dynamic political arena of the Diadochi wars in the Black Sea area and offer a glimpse into a complex and interconnected world of Hellenistic architects and artists. The monument will fuel discussions about the mechanisms of ritualised identity expression in mixed cultural environments, functioning under the pressure of political change, or about community membership, symbolic discourse and ancestors—all reflected in '*le jeu des miroirs*' of the funerary practices.

Valeriu Sîrbu is a senior archaeologist of the second Iron Age with more than forty years of experience. His main contributions are in the archaeology of ritual, magic, human and animal sacrifices, and sacred places and fortifications in Pre-Roman Dacia.

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