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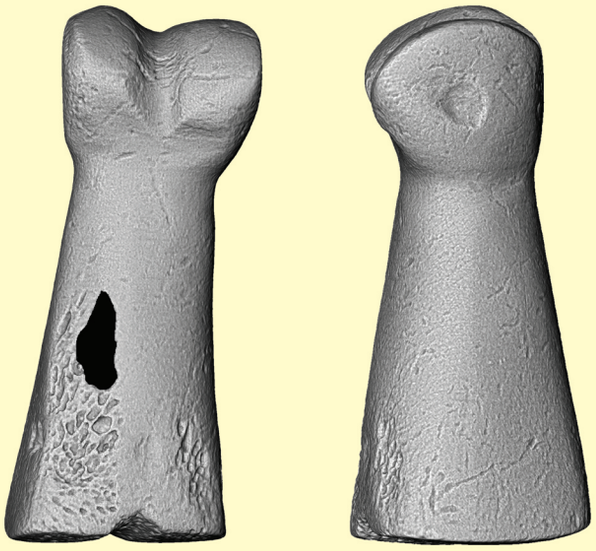

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Coperta: Figurină neolitică timpurie obținută dintr-o falangă de bovideu (vedere posterioară și laterală), descoperită în locuința adâncită Cx. 41A de la Tărtăria *Pietroșița* (scanare 3D: C. Șuteu)

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An Early Neolithic phalanx figurine from the Tărtăria *Pietroșița* site, Romania

Ioan Alexandru BĂRBAT*

Abstract: *The present article discusses the case of a cattle proximal phalanx discovered at Tărtăria* Pietroșița *during the rescue excavations at the end of 2014. The artefact was found in the Cx. 41A pit-house, which, from a chronological viewpoint, belongs to the Early Neolithic period or, more precisely, the mid-6th millennium cal. BC. The flattened appearance of the phalanx from feature Cx. 41A, similar to other objects from Neolithic sites in the Near East, raises the question of whether the item is part of the category of "anthropomorphic" figurines. This working hypothesis is also influenced by the remaining archaeological inventory of the Early Neolithic dwelling, which includes fragments of several female anthropomorphic clay figurines.*

Rezumat: *În acest articol este discutat cazul unei falange proximale de bovideu descoperite în situl Tărtăria* Pietroșița*, în timpul săpăturilor preventive de la sfârșitul anului 2014. Artefactul a fost găsit în locuința adâncită Cx. 41A, care poate fi încadrată din punct de vedere cronologic în neoliticul timpuriu, mai exact la mijlocul mileniului VI cal BC. Aspectul lustruit al falangei din Cx. 41A, asemenea altor obiecte similare descoperite în siturile neolitice din Orientul Apropiat, ridică întrebarea dacă nu cumva piesa poate fi încadrată în categoria figurinelor „antropomorfe". Această potențială ipoteză de lucru este influențată și de restul inventarului arheologic din locuința neolitică timpurie, alcătuit, printre altele, și din fragmentele unor figurine antropomorfe feminine din lut.*

Keywords: *cattle worked phalanx, anthropomorphic figurine, Prehistory, Early Neolithic, Starčevo-Criș cultural complex*

Cuvinte-cheie: *falangă prelucrată de bovideu, figurină antropomorfă, preistorie, neolitic timpuriu, complexul cultural Starčevo-Criș*

◈ Introduction

The use of phalanges in prehistory and later periods, similar to that of metacarpals, astragali, and metapodials, is attested in almost all geographical areas across the world. Regularly, in the past, these parts of the animal skeleton were preferred for crafting mainly figurines, amulets, pendants, gaming pieces, wind/musical instruments, and sometimes even tools. The fact that humans chose only certain types of bones in order to create the aforementioned objects, was motivated, we believe, by at least two considerations: practical reasons and symbolic significance.

In the case of phalanges, we must mention that their shape repertoire is quite varied, and several items stand out. In south-eastern Europe, the most famous decorated (horse) phalanx was probably an item discovered almost six decades ago in the rock shelter from Dubova *Cuina Turcului* (Romania), in the tardigravettian II (Mesolithic) level. Its ornamentation and morphology closely resemble a female anthropomorphic representation (Nicolăescu-Plopșor 1968a, p. 2, left figure; Nicolăescu-Plopșor 1968b; Vlassa 1968, p. 376, 378, fig. 5; Păunescu 1969, p. 344, 346-347, fig. 4/1a-1b; Păunescu 1970, p. 17, 19-22, fig. 11/1a-1d; Dumitrescu 1972, p. 17-18, Tav. 1/6-7; Dumitrescu 1974, p. 13, 15, fig. 2; Vlassa 1976, p. 78-81, nota 25, fig. 5; Păunescu 1978, p. 22, 25, 27,

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fig. 9/1a-1d; Boroneanț 2000, p. 192, 311, pl. 51/a-d; Păunescu 2000, p. 348, 350, fig. 140/2a-2d; Petrescu 2000, p. 42-43, 257, pl. CX/a-b; Chirica 2004, p. 108, 111, 113, fig. 4/7; Cârciumaru 2006, p. 232-233, fig. 131/27; Mărgărit 2008, p. 82-83, fig. 56; Boroneanț 2011, p. 115, 230, fig. 71/11; Chirica *et alii* 2016, p. 131, 279, 281, fig. 19/11, 21/2a-2d; Kovács 2016, p. 24, fig. 7; Cârciumaru, Nițu 2018, p. 361, fig. 76/1-7 and others).

From the moment of the first publication of the idol from *Cuina Turcului* (in 1968), the repertoire of modified phalanges from south-eastern Europe was substantially enriched, particularly in the case of prehistoric items. An adequate example in this sense is a figurine with anthropomorphic features – type of artefact known in literature as the "phalanx-idol" – discovered not long ago at Tărtăria *Pietroșița*, that will be the focus of the following section.

◈ Site location

Tărtăria *Pietroșița* is located in south-western Transylvania, Romania (pl. I/1). The archaeological site is situated to the east-north-east of the better-known settlement often referenced in the Neolithic and Eneolithic bibliography, as Tărtăria *Gura Luncii* (pl. II/1) (Horedt 1947-1949, p. 44-47; Vlassa 1963, p. 485-494; Vlassa 1976, p. 28-43; Lazarovici, Kalmar-Maxim 1991, p. 97-99; Lazarovici, Maxim-Kalmar 1991; Paul 2007, p. 20-44; Paul 2011, p. 9-50; Lazarovici *et alii* 2011; Luca 2016; Luca, Mărcuți 2018; Luca, Aldea 2019; Tudorie *et alii* 2024, etc.).

The *Pietroșița* site is located approximately 1 km north-east of the Tărtăria village (pl. I/2), Săliștea Commune, Alba County, on the first terrace of the left bank of the Mureș Valley (pl. II/2) (Bărbat, Barbu 2016, p. 307; Bărbat *et alii* 2020, p. 269; Bărbat, Barbu 2020, p. 79-80). In relation to the other cardinal points, the site is bounded to the north by the floodplain of the Mureș River, and to the south by the DN7 – Sebeș-Orăștie national road. To the east, the archaeological site is bordered by a currently dry former valley. Another landmark for locating the *Pietroșița* site in the field is the Simeria-Teiuș-Brașov railway, which crosses the site – approximately one third lies north of the railway, while two thirds are situated south of it.

◈ Research history and site stratigraphy

Tărtăria *Pietroșița* is less-known in historiography, given that the site has only relatively recently been identified (Moga, Ciugudean 1995, p. 186; Ghenescu *et alii* 2000, p. 76-78). The archaeological materials gathered from the terrace surface, discovered accidentally or during field surveys, prove the existence of several dwellings from the Neolithic, Eneolithic and the Early and Late Iron Ages, and the Medieval period (Moga, Ciugudean 1995, p. 186; Ghenescu *et alii* 2000, p. 76-78, 82-83, pl. VII-IX).

At the end of 2014 and the beginning of 2015, because of modernisation works of the Simeria-Brașov railway segment, rescue archaeological surveys were conducted at the *Pietroșița* site, or *Site 10*. Archaeological excavations were carried out along the entire length of the site, from east to west, along approximately 700 m. The excavations conducted from km 435+800 to km 436+300 of the railway segment along ca. 500 m with a varying width between 5 m (in the north-eastern area) and 18 m (in the south-western area), were coordinated by a team of archaeologists from the Museum of Dacian and Roman Civilisation of Deva and from the West University of Timișoara (Ferencz 2014, p. 4, 25-26; Ferencz, Roman 2015, p. 155-157; Craiovan, Micle 2015, p. 495-497; Ferencz, Roman 2016, p. 265; Bărbat, Barbu 2016, p. 307-308; Rogozea 2017, p. 7; Bărbat, Barbu 2020, p. 79-81; Bărbat *et alii* 2020, p. 269, 271-272). From km 436+300 to km 436+500,

along approximately 200 linear metres and a width similar to the previous one, the archaeological excavation was conducted by archaeologists from the Brukenthal National Museum and the "Lucian Blaga" University of Sibiu (Luca 2016, p. 10, 20, 28, 209-221).

In the spring of 2017, the traces of at least other 10 archaeological features were observed in the eastern part of the site, an area unfortunately damaged by unannounced construction works on the railway embankment (Bărbat *et alii* 2020, p. 272, 275). On this occasion, approximately 1 m below the bottom of an Early Neolithic feature, in the yellow clay-sand level of the terrace, lithic and faunal materials from the Palaeolithic period were found.

The research reports and studies published between 2014-2015 and 2017 regarding the archaeological discoveries from Tărtăria *Pietroșița* show very clearly that over an area of ca. 700 m in length (E-W) were excavated approximately 160 archaeological features. The excavation results confirmed the past information from accidental discoveries or field surveys (Moga, Ciugudean 1995, p. 186; Ghenescu *et alii* 2000, p. 76-78, 82-83, pl. VII-IX). Across the millennia, from the Upper Paleolithic (?) until the end of the Early Medieval, the *Pietroșița* terrace was inhabited (Ferencz 2014, p. 5, 30-274; Ferencz, Roman 2015, p. 155-164, fig. 5-8; Craiovan, Micle 2015, p. 495-506, fig. 2-13; Ferencz, Roman 2016, p. 265-268, 271-277, pl. 2-8; Bărbat, Barbu 2016, p. 307-334, fig. 5-12; Rogozea 2017, p. 7-16, fig. 1-6, pl. 3-10; Bărbat, Barbu 2020, p. 79-80, 97-101, pl. III-VII; Bărbat *et alii* 2020, p. 269-284, fig. 3-12).

Based on the 2017 observations, in the south-eastern sector ("A") of the site, in an area that had been less damaged by the railway embankment works, we can confidently state that the stratigraphy is by no means complicated. Overall, it comprises four main pedological levels, whose detailed descriptions are as follows: 1. Dark-brown, loose arable soil with archaeological materials in secondary position 0.00-0.30 m; 2. Light brown clay with yellow hues, corresponding to the occupational level of the site -0.30-0.70/0.80 m; 3. Yellow clay level with calcareous concretions, containing most of the archaeological features, sometimes Paleolithic finds as well -0.70/0.80-1.80 m; 4. White-yellow calcareous-clay level, archaeologically sterile -1.80-3.50 m.

◈ The archaeological context and chronology of the feature Cx. 41A

As previously mentioned, during the rescue excavations at the end of 2014 and the beginning of 2015 in Tărtăria *Pietroșița*, a series of features were investigated, assigned to the Neolithic, the Eneolithic, the Bronze Age, the Early and Late Iron Ages and the Early Middle Ages.

In the site's eastern "Zone A", *i.e.* in the higher area of the terrace, in November and December 2014, four Early Neolithic archaeological features were studied on the Sp. I surface, namely Cx. 28, Cx. 32, Cx. 41 (with at least two phases – Cx. 41A and Cx. 41B) and Cx. 47 (Bărbat *et alii* 2020, p. 272-275, fig. 3-4). Two other archaeological features from the Early Neolithic – Cx. 1 and Cx. 10 – were identified in the spring of 2017, in "Zone A", in the area near the Sp. II archaeological surface. Unfortunately, they had been affected by the works on the railway embankment and, therefore, very little archaeological information was recovered (Bărbat *et alii* 2020, p. 272, 275-276, fig. 5).

In the site's western "Zone B", more precisely in the lower area of the terrace, at the end of 2014, four inhumation graves were identified and studied, apparently all dating from the Early Neolithic. Despite the fact that, in this sector, no traces of dwelling-type archaeological features were found, the subsequent field surveys conducted south of the railway segment led to the discovery of Early Neolithic archaeological materials in the fields

ploughed in autumn or spring. This shows that the Starčevo-Criș settlement (or perhaps necropolis) extends to this part of the *Pietroșița* terrace.

The stylised figurine (pl. IV-V), obtained by abrasion from a cattle proximal phalanx, the central focus of the present article, was discovered in the eastern sector of the site, known as "Zone A", more precisely in pit-house Cx. 41A (pl. III/1-2) (Bărbat *et alii* 2020, p. 272-274, fig. 3/1-2). Feature Cx. 41A was identified at the end of 2014[1], below the Cx. 41B surface structure, at ca. -0.30-0.35 m, also below the walking level of the *Pietroșița* site. The partial excavation of Cx. 41A (the archaeological feature extended also to the north-west, under the service road) suggested that the pit of Cx. 41A had a quasi-circular shape[2]. The architectural elements of the pit-feature are very few, among them a post hole discovered in the south-western corner of Cx. 41A. We must also mention the fact that the bottom of Cx. 41A was uneven. During the excavations, the traces of a lens of fine brown clay was also noted – possibly a repair of the walking surface (the clay floor) inside the pit-house.

The chronology of Cx. 41A has been established based on both the characteristics of the inventory, particularly those of the pottery, and the ^{14}C dates on a small sample of osteological materials. With respect to the relative chronology, we must emphasise that the nature, forms and ornaments of the pottery from feature Cx. 41A were also noted on a series of Early Neolithic sites from the neighbouring area, such as Călanul Nou *La Podină* (Ciută, Andrei 1999, p. 35-42), Geoagiu *Folorât* (unpublished finds), Ghirbom *La Ghezuini* (Aldea 1972, p. 3-4, 8), Hunedoara *Cimitirul Reformat* (Drașovean 1981, p. 35-37, 39, 41-42, fig. 1; Drașovean 1986-1987, p. 11-13, 16; Drașovean 2002a, p. 60-61; Drașovean 2002b, p. 45-46), Sebeș *Casa Jampa* (Drașovean 1981, p. 35-36, 39, 41-42, fig. 1) etc., at a phase III level (sub-phases A and B) of the Starčevo-Criș cultural complex, according to the periodization system proposed by Gheorghe Lazarovici (Lazarovici 1977, p. 37-40; Lazarovici 1979, p. 47-50; Lazarovici 1984, p. 64-68; Maxim 1999, p. 45-46; Tudorie 2013, p. 28, 60-61).

The radiocarbon results, currently unpublished[3], place the chronology of Cx. 41A and Cx. 41B around the mid-6th millennium BC[4].

◈ Description of the phalanx

The initial shape of the proximal cattle phalanx was elongated, with prominent ungual tuberosities and epiphysis, with a quasi-circular section diaphysis. The archaeological item was obtained by abrasion[5] (pl. IV/1-2). The care with which the phalanx was crafted proves the Early

[1] The maximum depth of the pit of Cx. 41A was of -1.50 m below the walking surface of the site in 2014, in the western area of the feature.

[2] The maximum length of the pit is of 3.90 m, on the north-east – south-west axis, and the (partial) maximum width is of ca. 2.40 m, on the north-west – south-east axis.

[3] The radiocarbon dating was carried out on four osteological samples from Cx. 41A and Cx. 41 B, at the "Horia Hulubei" National Institute for Physics and Nuclear Engineering (IFIN-HH) in Bucharest-Măgurele. The fauna samples were collected from a depth of –0.20 m to –0.40 m and the archaeozoological analysis showed that they belonged to the *Bos taurus* species – a phalanx, a femur, a coxal and a radius (identified by the late archaeozoologist Valentin Dumitrașcu, "Vasile Pârvan" Institute of Archaeology in Bucharest).

[4] The radiometric ages obtained for the zooarchaeological items from the Tărtăria *Pietroșița* site, together with detailed information on the architecture of the Starčevo-Criș settlement, will be published in a separate study.

[5] The dimensions of the item: 59.64 mm in length and 25.02 mm in width (in the diaphysis part).

Neolithic "artist's" clear intentions and attention to detail, given the artefact's appearance as a possible "anthropomorphic" figurine. The macroscopic and microscopic observations have helped us reconstruct part of the operational sequence that led to the transformation of the phalanx into a small piece of prehistoric art.

Macroscopic observations

This particular phalanx was not chosen randomly, considering the fact that its size is adequate for its transformation into a figurine. The item's surface bears traces of abrasion, generally in the form of fine, horizontal striations (relative to the current vertical position of the item). The appearance and placement of the striations indicate the manipulation of the phalanx across an abrasive surface, probably a small stone plaque. Such items, sometimes somewhat hollowed at the active end – fine, fragmentary, made of grey sandstone – have been identified in Cx. 41A. During the shaping procedure, the maker focused on flattening the epiphysis / proximal end (the base), so that the phalanx stands vertically, the intensity of the polishing having partially revealed the spongy tissue. Moreover, the diaphysis / mesial part, the ungual tuberosities / distal area, and the lateral sides underwent transformations due to the polishing, which led to the slight alteration of the phalanx's initial appearance or even to its deterioration, particularly by exposing the spongy tissue. Another issue regarded the appearance of a small, irregular, elongated orifice on the phalanx's plantar surface (pl. IV/1a, 2b, V/1b). It is very likely that its occurrence was connected to the aforementioned crafting methods, which indirectly led to the thinning of the bone tissue, a phenomenon that was later amplified by the post-depositional processes in Cx. 41A (for instance, the compaction of the archaeological sediment), which we consider to be responsible for the appearance of this small perforation[6]. Given the item's smooth surface, we believe that another stage could have involved polishing the phalanx on a soft surface, possibly a piece of leather or a piece of fabric.

Microscopic observations

The aforementioned marks observed with the naked eye on the surface of the artefact were mostly confirmed by the observations under a digital microscope[7]. It would appear that the finishing of the phalanx was carried out on each face of the diaphysis, as indicated by the dense, short and horizontal striations on its surface (pl. V/1b-1e, 3-7). Other similar, but rather rare, traces of abrasion that intersected the previous ones are the vertical and oblique striations. Somewhat harder to detect and less frequent are the traces left by the abrasion of the item on the epiphysis / proximal part (the base) (pl. V/1f, 8) and the ungual tuberosities / distal area (pl. V/1a, 2), which also appear as small striations.

[6] To the details already presented, we can also add the sharp edges, including the small fragments of bone tissue located inside the phalanx (discovered while washing the artefact), indicating a fragmentation caused by the conditions in which the item was preserved in the archaeological sediment. This phenomenon is well known in the scholarly literature, which is why some authors suggest that part of the perforated phalanges should be reassessed, from the viewpoint of their connection to the post-depositional processes, therefore excluding the anthropic role (Harrison 1978, p. 10, 13, 17-20, fig. 3/1-4; Chase 1990; Chase 2001, p. 17, 22-23; Cârciumaru 2023, p. 169, fig. 124). Some researchers have taken this analysis even further, by pointing out a connection between the occurrence of the perforations in the phalanges and the fact that these items could have been part of the diet of certain carnivorous animals (see a detailed description in this sense in Cârciumaru 2023, p. 169).

[7] The microscope used during the investigations: Levenhuk Discovery Artisan 32.

After evaluating the macro- and microscopic observations of the proximal phalanx, we can conclude that we have some "anthropomorphic elements" of the figurine. Some of these could be associated with human body morphology, but in a very stylised manner. For example, the distal part of the phalanx could be compared with a human head (with the eyes), the mesial part of the same artefact is close to the shape of a human body, and the proximal end looks like the soles of a human foot, but in an abstract way.

◈ Discussion

The present study cannot limit to merely recording and describing the artefact. Thus, we must carry out a more in-depth approach to the phalanx discovered in Tărtăria *Pietroșița* by addressing the following discussion points (1-4).

1. General and particular aspects regarding the archaeological context

Cx. 41A, the discovery place of the figurine, is a pit-feature characteristic to the classical Early Neolithic Starčevo-Criș cultural complex (pl. III/2), according to the radiocarbon data and the archaeological materials. Cx. 41A is no different from other Early Neolithic features from this chronological timeframe, its aspect matching other neighbouring sites, for instance Ghirbom *La Ghezuini* (Aldea 1972, p. 3, fig. 1) and Orăștie *Dealul Pemilor* X8 (Luca *et alii* 1998, p. 17, 22, pl. I; Luca, Pinter 2001, p. 28, pl. 1).

"Exception" makes the richness and diversity of the archaeological materials from Cx. 41A, typical for certain dwellings of the classic and late phases of the Starčevo-Criș cultural complex. What is particular in the case of Cx. 41A, in addition to the phalanx figurine is a series of archaeological materials, some of which of great interest to the array under scrutiny. From among the already published items, we must note the presence of adornment items / clothing accessories (?), such as perforated *Unio* shell, a perforated discoidal object made of bone and a bone preform item (Bărbat *et alii* 2020, p. 277-281, fig. 7-8, 10-11, table 1). There are also other archaeological materials from the same Early Neolithic feature, somewhat special, still unpublished. These include bone and antler tools, chipped and polished stone tools, a rich assemblage of osteological and ceramic materials, as well as a small assemblage of fired clay items. Among the sculptural fragments, several belong to the "Venus"- type figurine series (pl. VI/1-3). Two of the fragments could, in fact, belong to a single steatopygous statuette (pl. VI/1-2). This final category of artefacts from Cx. 41A are known within the Starčevo-Criș cultural complex, with analogies in numerous sites from south-eastern Europe (particularly in western Romania, eastern Hungary and northern Serbia), as indicated by the fragmented, refitted, and complete anthropomorphic figurines from Donja Branjevina (Karmanski 2000, p. 46, 93-104, 228-235, Sl. 47, 99-101, 141-142, T. I-IV; Karmanski 2005, p. 6, 23, 25-27, 83, 85-86, 36-39, fig. 14/1-2, 16/4, 17, pl. I, III-IV), Endrőd *3/119*, *3/82*, *3/39* (Makkay, Starnini 2008, p. 45, 441, 443-444, 446-447, 449, fig. 4, 6/2-3, 5-6, 7/1, 9-10, 12), Méhtelek-Nádas (Makkay, Starnini 2008, p. 45, 442, 448, fig. 5, 11; Kalicz 2011, p. 61-64, fig. 7/6, 8, 14, 8, 9/1, 4-5, 10-12, 10/8-10, 12), Homorodul de Sus *Ograda Borzului* (Bader 1968, p. 382-384, fig. 1/1-5, 2/1-3), Zăuan *Dâlma cimitirului*/*Temetődomb* (Lakó 1977, p. 42-43, fig. 2-3; Lazarovici 1988, p. 23-25, 46, fig. 1/1; Băcueț Crișan 2008, p. 50, pl. 11 – the upper photo), etc.

From the viewpoint of the quantity and quality of the archaeological materials, the inventory of feature Cx. 41A could reflect a "certain status" of the occupant/occupants of the former Early Neolithic dwelling in relation to the other members of the Starčevo-Criș settlement (Bărbat *et alii* 2020, p. 284). However, after the dwelling was abandoned, it may

have played a role in the Early Neolithic community from *Pietroșița*, namely that of a place used as a discard area for non-functional, less useful items.

2. Worked phalanges during the Early Neolithic

For the beginning of the Neolithic in the Carpathian Basin, the Tărtăria *Pietrioșița* figurine is a landmark. Such artefacts are very rare in the Starčevo-Criș cultural complex in south-eastern Europe, from the end of the 7th millennium cal BC to the mid-6th millennium cal BC. The presence of certain phalanges showing working traces in this cultural area is also attested at late Starčevo-Criș settlements (IVA-IVB) from Trestiana (Romania) (Haimovici 2003, p. 293; Popușoi 2005, p. 72, 231, fig. 34/6) and Selište (Republic of Moldova) (Dergacev, Larina 2015, p. 329, 489, pl. 141/23-24). One example is the fragmented deer phalanx with a quasi-circular perforation on the plantar side of the distal end, with the ungual tuberosities slightly damaged (Haimovici 2003, p. 293; Popușoi 2005, p. 72, 231, fig. 34/6). Another example are two artefacts made possibly from cattle bones. One of the phalanges was deteriorated (laterally, the plantar and dorsal sides), possibly during the attempt to perforate it, while the second phalanx has an approximately oval orifice on the plantar side (Dergacev, Larina 2015, p. 329, 489, pl. 141/23-24). The purpose of these apparently unfinished items (that, quite obviously, differ from the phalanx discovered in Tărtăria *Pietroșița*) is rather unclear. Possible functions include that of pendant, in the case of the deer phalanx from Trestiana, or wind/musical instruments, in the case of the two phalanges from Selište.

Looking for the closest analogies for the phalanx-figurine from Tărtăria *Pietrioșița*, literature suggests such artefacts are rather frequently encountered in Near East Neolithic settlements[8]. In many cases, equid (*Equus*) proximal phalanges were used as raw materials (Christidou *et alii* 2009, p. 319; Campana, Crabtree 2019, p. 72-73, 75; Pawłowska, Barański 2020, p. 2-9). This does not apply to the figurine from Tărtăria *Pietrioșița*, given that it was made from a proximal phalanx, but that of some cattle[9]. As previously mentioned, figurines similar in aspect or working manner are found in the Near East, as, for instance, in the Pre-Pottery Neolithic levels (PPNA-PPNB) at Dja'de el Mughara (Syria), dated between 9300-8200 cal BC (pl. VII/1a-1c) (Christidou *et alii* 2009, p. 319-333, fig. 4-8, 10-11). Further west, such figurines were discovered in the Neolithic and Eneolithic sites in Turkey. The earliest worked phalanges are from the Pre-Pottery site – PPNB – from Sayburç, dated between 8600-8300 cal BC (Karul *et alii* 2024, p. 86). Somewhat later, dating to the 8th-6th millennia cal BC, are the discoveries from the sites at Tepecik-Çiftlik, which yielded the most significant collection of worked phalanges (pl. VII/2a-2d), with over 250 items (Biçakci *et alii* 2007, p. 246, 256, fig. 47/h-l; Campana, Crabtree 2018, p. 79, 80, fig. 11-12; Campana, Crabtree 2019, p. 72-75, fig. 1-3), and Çatalhöyük - GDN Area (pl. VII/3) (Pawłowska 2020, p. 150-152, fig. 5; Pawłowska, Barański 2020, p. 2-8, fig. 2-5, 7-8).

For the analogies above, we must note the polished appearance of the figurines, very similar to the item from Tărtăria, some even depicting anthropomorphic elements (pl. VII/3) (Pawłowska 2020, p. 150, fig. 5; Pawłowska, Barański 2020, p. 4-5, fig. 4-5, 8).

[8] For the Neolithic Period, more precisely the moment of the transition towards the Pre-Pottery Neolithic (in the Late Natufian – PPNA interval), the oldest worked phalanges (that resemble figurines) were identified in north-eastern Jordan, at Shubayqa 6 (Yeomans *et alii* 2021, p. 123-136).

[9] Interestingly, at precisely the same chronological level as the earliest equid figurines from the transitional period between the Pre-Pottery Neolithic (PPN) and the Pottery Neolithic (PN) in the Near East, more than 1000 km to the west, in the Mesolithic layer from Dubrova *Cuina Turcului* (Romania), an anthropomorphic figurine crafted from an equid phalanx was "discarded" (see the bibliography above).

3. Several interpretations of the macro- and microscopic observations

We believe there is no doubt regarding the intention of transforming the cattle left proximal phalanx into a figurine. The working traces identified (both macro- and microscopic) on the surface of the phalanx, are indicative of the care given to this bone piece in the Early Neolithic, in order to obtain a distinctive finite product bearing several subtle anthropomorphic features. We must note that the smoothing/flattening of the epiphysis (the proximal part of the phalanx) facilitated its placement vertically. Moreover, the smooth polishing of the diaphysis / mesial area, in addition to the slight abrasion of its distal part, confers the item an anthropomorphic appearance. Regarding the distal part, we must also note the shape of the ungual tuberosities, somewhat modified through lateral abrasion, just enough to emphasise the phalanx's anthropomorphic features (*e.g.* like the head, eyes). If the artefact is indicative of a human figure, it is uncertain though whether it is a masculine or feminine representation, given that no intervention was attempted to mark the torso or the sex areas.

The current aspect of the figurine, polished but lacking decorative elements, may suggest it had been initially dressed in a piece of textile that was not preserved. It is possible that the phalanx rubbed on a cloth, either during its making or through handling over time, which may have amplified the artefact's glossy appearance[10]. If we accept the hypothesis of certain textile clothing elements on the anthropomorphic figurine from Tărtăria *Pietroșița*, then we must invoke the example of the ethnographic analogies from the African continent, where the clay statuettes and the ruminant metapodials include items of adornment and clothing and they are used as "puppets" with both magical and profane functions (de Maret 2016, p. 501-507; Sidéra, de Maret 2016, p. 316; Palaguta 2023, p. 74-75, 84, fig. 1/6). Such parts of animal skeletons, with minimal interventions on the bone surface, but with adornments and clothing, were attested in Guinea-Bissau, Namibia, Nigeria, Mali etc. (de Maret 2016, p. 501-507, fig. 4-6; Sidéra, de Maret 2016, p. 315-320, fig. 3-6).

What is interesting is that the use of adornments or clothing was also noted on certain archaeological items from the phalanx category, usually due to the decorations preserved/visible on the artefacts' surfaces. A very good example is the horse phalanx from Dubova *Cuina Turcului* (see the bibliography above), followed by a series of other items, including the goat phalanx polished on the posterior side, with mother-of-pearl eyes, from Berry-au-Bac le Vieux Tordoir (France) dated to the linear pottery culture (Allard *et alii* 1997, p. 33, 40, fig. 4-5; Sidéra 2000, p. 143, 145, fig. 29/15; Sidéra 2008-2009, p. 14, 17, fig. 2/1-2; Sidéra, de Maret 2016, p. 320, fig. 8/3), or the phalanges discovered at the Eneolithic sites of the Botai culture from Central Asia (Kazakhstan) (Olsen, Harding 2008, p. 75-80, fig. 4.6-4.9; Gorelik 2023, p. 21, fig. 6/3-4, 7-9, 11-12; Usmanova *et alii* 2024, p. 31-36, fig. 4-9). Along the same lines, we must also mention the discovery of an anthropomorphic figurine in level Vb at Ulucak (Turkey), dated to the end of the 7th millennium BC (final Late Neolithic). The latter was associated with fabric remains, interpreted either as the idol's clothing or a textile piece in which the object had been wrapped (Çilingiroğlu 2009, p. 12, 15-17, fig. 7).

4. A chorological perspective

Regarding the possible interpretations of the place of discovery of the cattle phalanx bearing anthropomorphic features, we must mention the fact that its occurrence inside a

[10] We assume that the current overall appearance of the figurine was also influenced by the "patina" of time, that is calcium carbonate deposits on the surface of the phalanx, resulting from the artefact's contact with the archaeological sediment.

dwelling is not particularly unusual for the Neolithic Period. Many examples come from the Near East, where such artefacts were attested in the domestic space rather frequently. Very clear observations were made at the site from Çatalhöyük, where the so-called "phalanx-idols" were discovered within dwellings or in their annexes, in areas used for grain storage. Such context-related details convinced certain scholars to doubt the "idol" function of the figurines made from the phalanges of donkeys or wild horses from the Neolithic settlement from Çatalhöyük – in the sense of objects of worship (Pawłowska 2020, p. 152; Pawłowska, Barański 2020, p. 7-9).

Outside the domestic space, proximal phalanges were also discovered in necropolises, together with the typical funerary inventory of the deceased (consisting of pottery, ornaments and/or clothing accessories, etc.). What is particularly revealing in this case are the unworked phalanges, predominantly from *Equus hydruntinus* and, more rarely, from *Equus germanicus transilvanicus*, discovered in several inhumation graves or cenotaphs from the late phase (III) of the Hamangia culture from Durankulak. They were placed at the head or on the chest of the deceased and were identified in the following archaeological contexts: 609, 642, 908, 958, 968, 994, 1006 and 1036 (Vajsov 1992, p. 98, Taf. 2/B13, C19; Todorova, Vajsov 1993, p. 226-227, fig. 221; Vajsov 2002, p. 259-261, Abb. 251/2, 254/1-2; Todorova *et alii* 2002, p. 61, 63, 75, 77, 78-80, tabl. 103/11, 110/2, 158/1, 164/5, 166/10, 171/1; Voinea 2009, p. 84)[11]. Despite having been discovered in funerary archaeological features, in addition to other inventory objects, the phalanges seem to have played a distinctive role, as the discovery from grave 1036 suggests. In this case, the phalanx placed several centimetres from the head was laid out next to a female anthropomorphic statuette (Todorova, Vajsov 1993, p. 226-227, fig. 221; Vajsov 2002, p. 260-261, Abb. 254/1-2; Todorova *et alii* 2002, p. 80, tabl. 171/1, 6; Voinea 2009, p. 84). This "minor" detail led us to believe that the bone item could also have played the role of an anthropomorphic figurine (?), a hypothesis that has also been discussed by other researchers (Spassov, Iliev 2002, p. 315; Voinea 2009, p. 84). Other graves from the Neolithic / Eneolithic necropolis at Durankulak – such as graves 609 and 642 – also showed this association, alongside the typical funerary inventory of the deceased (consisting of pottery, ornaments and/or clothing accessories, etc.) (Vajsov 1992, p. 98, Taf. 2/B12-13, C18-19; Todorova *et alii* 2002, p. 61, 63, tabl. 103/10-11, 110/1-2; Voinea 2009, p. 84).

The association of proximal phalanges of *Equus* with female anthropomorphic figurines in several inhumation graves at Durankulak, or even the mere presence of either phalanges or female figurines in several graves or cenotaphs, shows at least one form of funerary behaviour among the Hamangia culture. It would appear that this funerary practice is not isolated – it was observed in the case of other Neolithic and Eneolithic communities, and even in later periods[12]. Thus, in this context, the inhumation grave at Berry-au-Bac le Vieux Tordoir (France), from the linear pottery cultural context is one such example, given that it contained a goat phalanx polished on the posterior side and featuring mother-of-pearl eyes (Allard *et alii* 1997, p. 33, 40, fig. 4-5; Sidéra 2000, p. 143, 145, fig. 29/15; Sidéra 2008-2009, p. 14,

[11] In the Hamangia culture necropolises, it would appear that the custom of placing a *Equus* proximal phalanx was observed only in Durankulak; other graves from the same archaeological culture din not show this practice or it is unclear (Berciu 1966, p. 81-85; Hașotti 1997, p. 28-29, 32; Lazăr, Opriș 2012, p. 76-77; Lazăr 2020, p. 171-174).

[12] The presence of the phalanges in the graves was also dated to later periods, for instance in the form of certain adornment items, or pendants, among the Carpic communities of the 2nd and 3rd centuries AD (Căpitanu 1975, p. 313, 318, fig. 17/4).

17, fig. 2/1-2; Sidéra, de Maret 2016, p. 320, fig. 8/3). This item probably represents an anthropomorphic figurine.

Returning to the feature Cx. 41A, we must note the striking similarity between the special-purpose artefacts found within the dwelling from Tărtăria *Pietroșița* and certain items from the burial inventories in the Durankulak necropolis, such as the phalanges, the anthropomorphic figurines and the adornments. The placement of this type of archaeological items in certain Late Neolithic / Early Eneolithic graves is undoubtedly linked to the funerary practices. The presence of the same set of artefacts in domestic settings during the Early Neolithic period, if not a mere coincidence, could be linked to the burial or abandonment of the dwelling, similarly to two different but chronologically fairly close cultural areas.

◈ Several concluding remarks

The cattle proximal phalanx identified in the Starčevo-Criș Cx. 41A pit-feature – excavated in the Tărtăria *Pietroșița* site – presents a morphology (given its working) similar to that of the stylised anthropomorphic figurine category. The discovery of the item alongside a series of special artefacts in the same archaeological context, such as bone and shell adornments / clothing accessories, in addition to fragments of clay female statuettes, may possibly indicate the existence of a close connection between the phalanx and the special inventory of the pit-house.

The cattle proximal phalanx from the Early Neolithic dwelling investigated at the *Pietroșița* site, within the context of the few similar pieces in the Starčevo-Criș cultural complex area, reveals connections to proximal phalanges transformed into possible "idols" from the Near Eastern region. Despite the similarities, the rarity of these archaeological artefacts in Early Neolithic sites in Southeast Europe raises several questions and offers some possible answers:

1. Does the making of the artefact from Tărtăria *Pietroșița* reflect an older tradition/ cultural heritage, dating back to the beginning of the Neolithic Period, possibly from the Anatolian Plateau region?

2. Could the transformation of the proximal bovine phalanx into an anthropomorphic figurine be attributed to particular aspects of the material culture of the Starčevo-Criș communities in south-western Transylvania, which thus addressed the challenges of daily life from the mid-6th millennium cal BC?

3. Could the assemblage of special artefacts from Cx. 41A have originated from a shaman's toolkit, even though some of these special pieces do not differ from other objects found in Early Neolithic features at the Tărtăria *Pietroșița* site? (Bărbat *et alii* 2020, p. 283)

4. Could the mere association of proximal equid phalanges with female anthropomorphic idols in certain inhumation graves at Durankulak (Bulgaria) (Vajsov 1992, p. 98, Taf. 2/B12-13, C18-19; Todorova, Vajsov 1993, p. 226-227, fig. 221; Vajsov 2002, p. 260-261, Abb. 254/1-2; Todorova *et alii* 2002, p. 61, 63, 80, tabl. 103/10-11, 110/1-2, 171/1, 6; Voinea 2009, p. 84) – a context similar to that in which certain items from the Tărtăria *Pietroșița* archaeological feature were found – illustrate a practice with related meanings, or is it merely a coincidence?

5. Could it be, as we have noted on previous occasions (Bărbat *et alii* 2020, p. 284), that the entire inventory of the archaeological feature reflects a certain "status within the community" of those who used the Cx. 41A pit-house, or we are dealing with an area for discarding the non-utilitarian items?

What is certain is that the string of questions above could continue. However, the answer, even it were merely partial or rather inexact, could lie in the results of the future research endeavours in the neighbouring areas and beyond.

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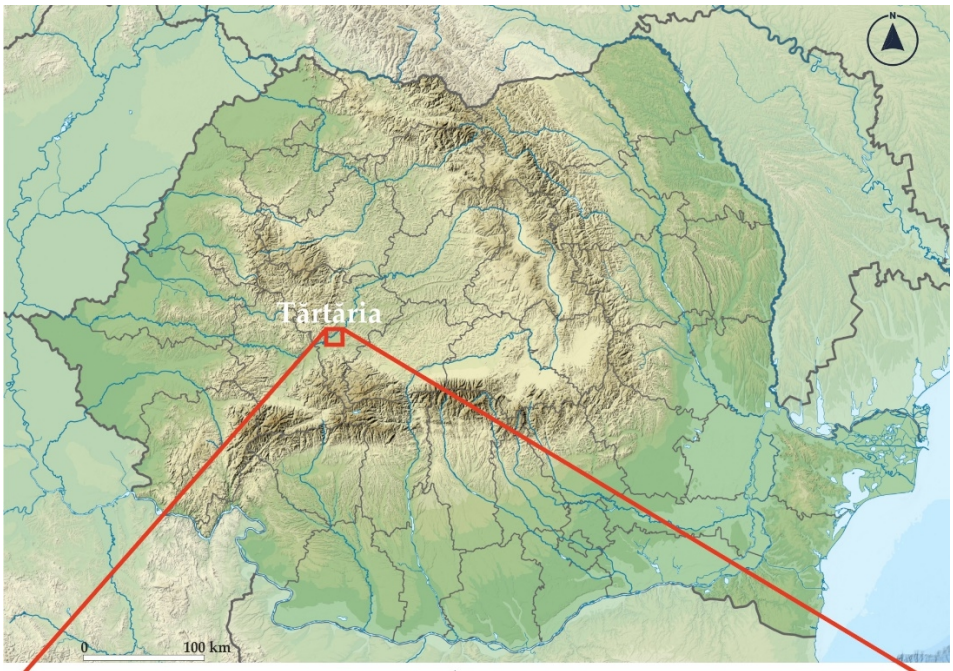

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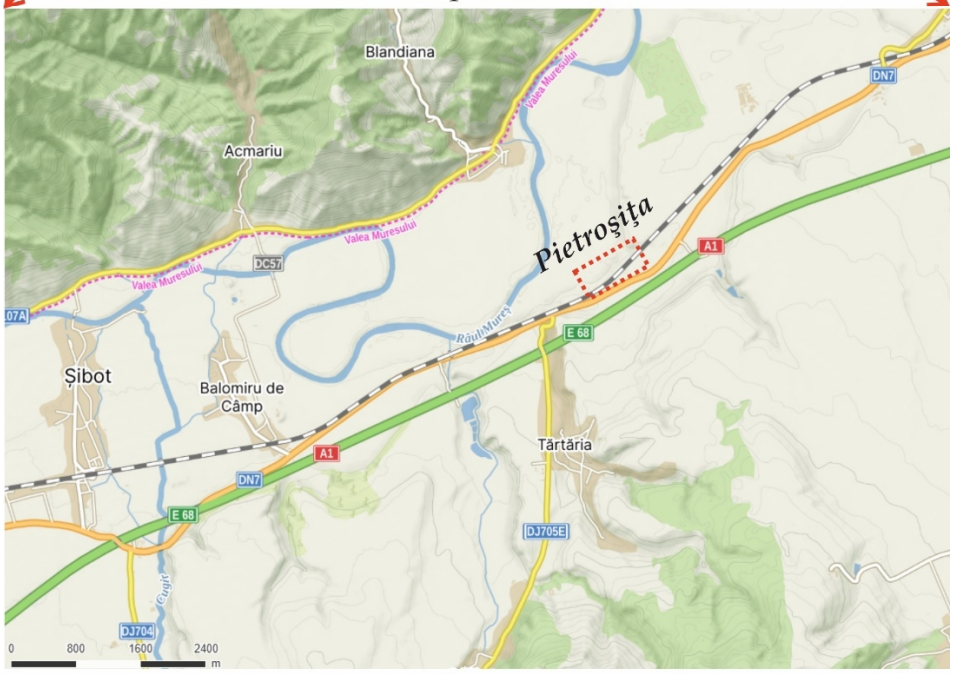

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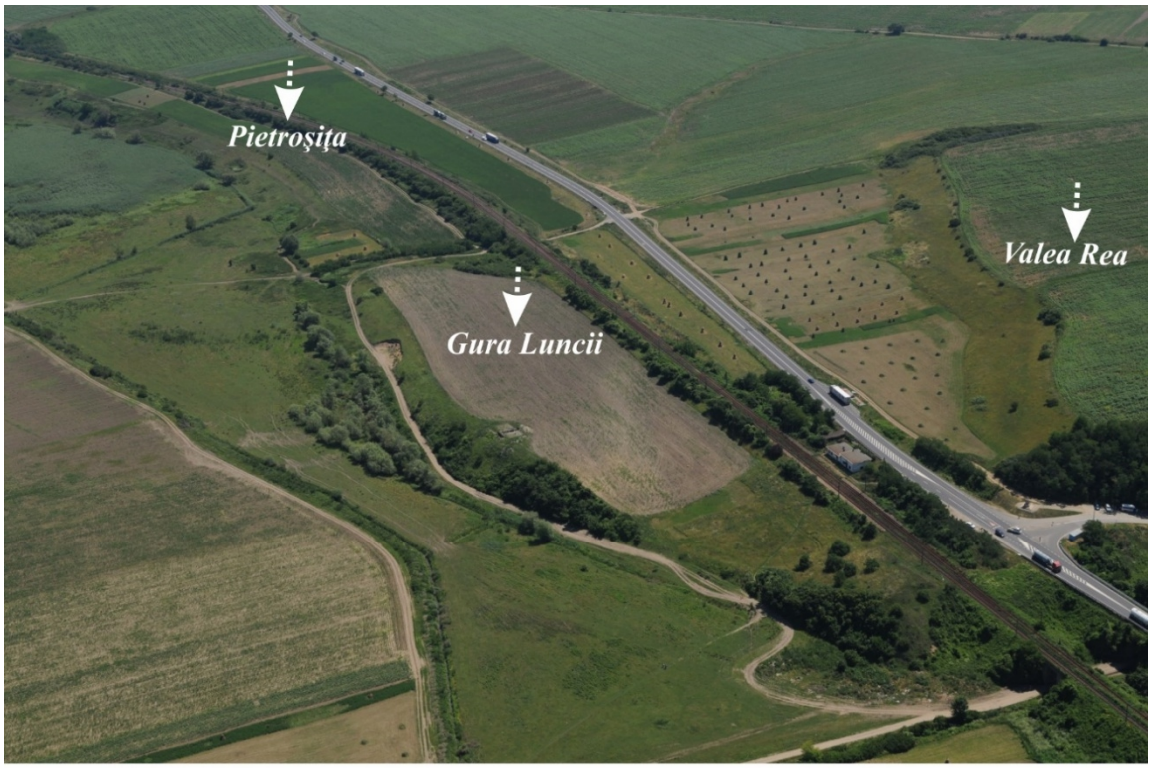
Pl. I. 1. Location of Tărtăria village on the map of Romania (modified map after https://upload.wikimedia.org/wikipedia/commons/thumb/b/bc/Romania_relief_location_map.svg/2560px-Romania_relief_location_map.svg.png; 2. Detail with the Tărtăria *Pietroșița* site location (modified map after https://mapy.com/en/turisticka?x=23.4195822&y=45.9509269&z=13).
1. Localizarea satului Tărtăria pe harta României (prelucrare după https://upload.wikimedia.org/wikipedia/commons/thumb/b/bc/Romania_relief_location_map.svg/2560px-Romania_relief_location_map.svg.png); 2. Detaliu cu localizarea sitului Tărtăria *Pietroșița* (hartă modificată după https://mapy.com/en/turisticka?x=23.4195822&y=45.9509269&z=13).



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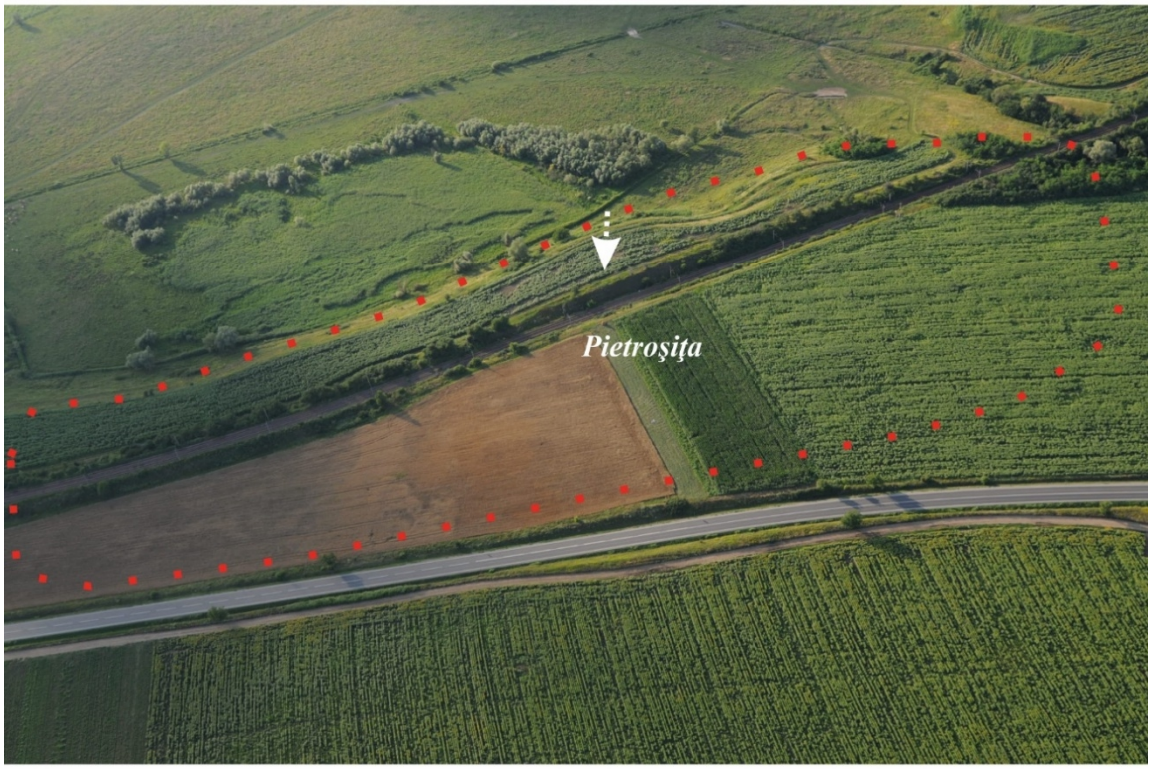

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Pl. II. 1. Aerophotography of the archaeological sites in the northeastern side of Tărtăria village (photo: Z. Czajlik); 2. Aerial view of the *Pietroșița* site, whose approximate boundaries are marked with red dots (photo: Z. Czajlik).
1. Aerofotografie cu siturile arheologice din partea de nord-est a satului Tărtăria (photo: Z. Czajlik); 2. Vedere aeriană cu situl *Pietroșița*, ale cărui limite aproximative sunt marcate cu puncte roșii (photo: Z. Czajlik).

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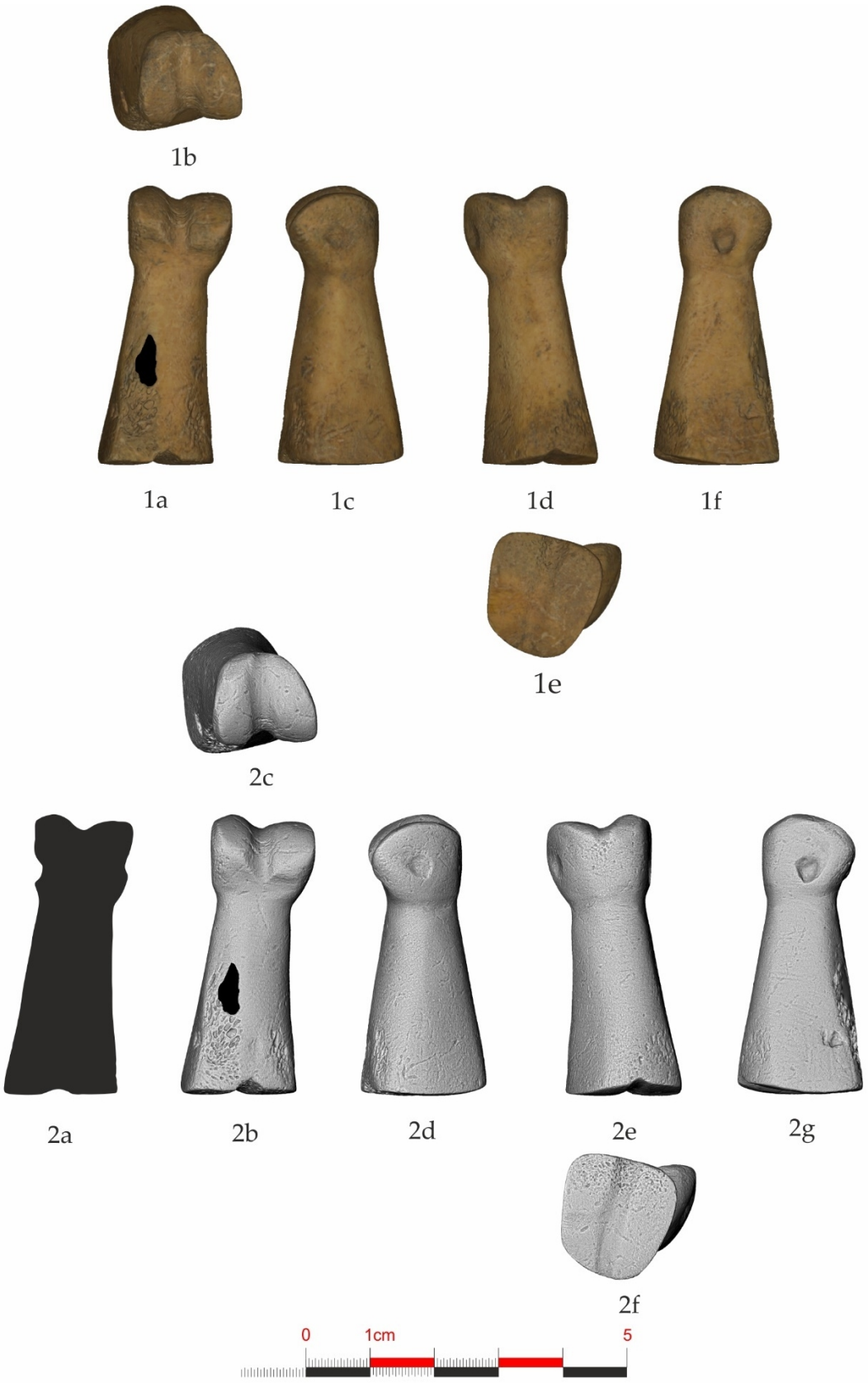
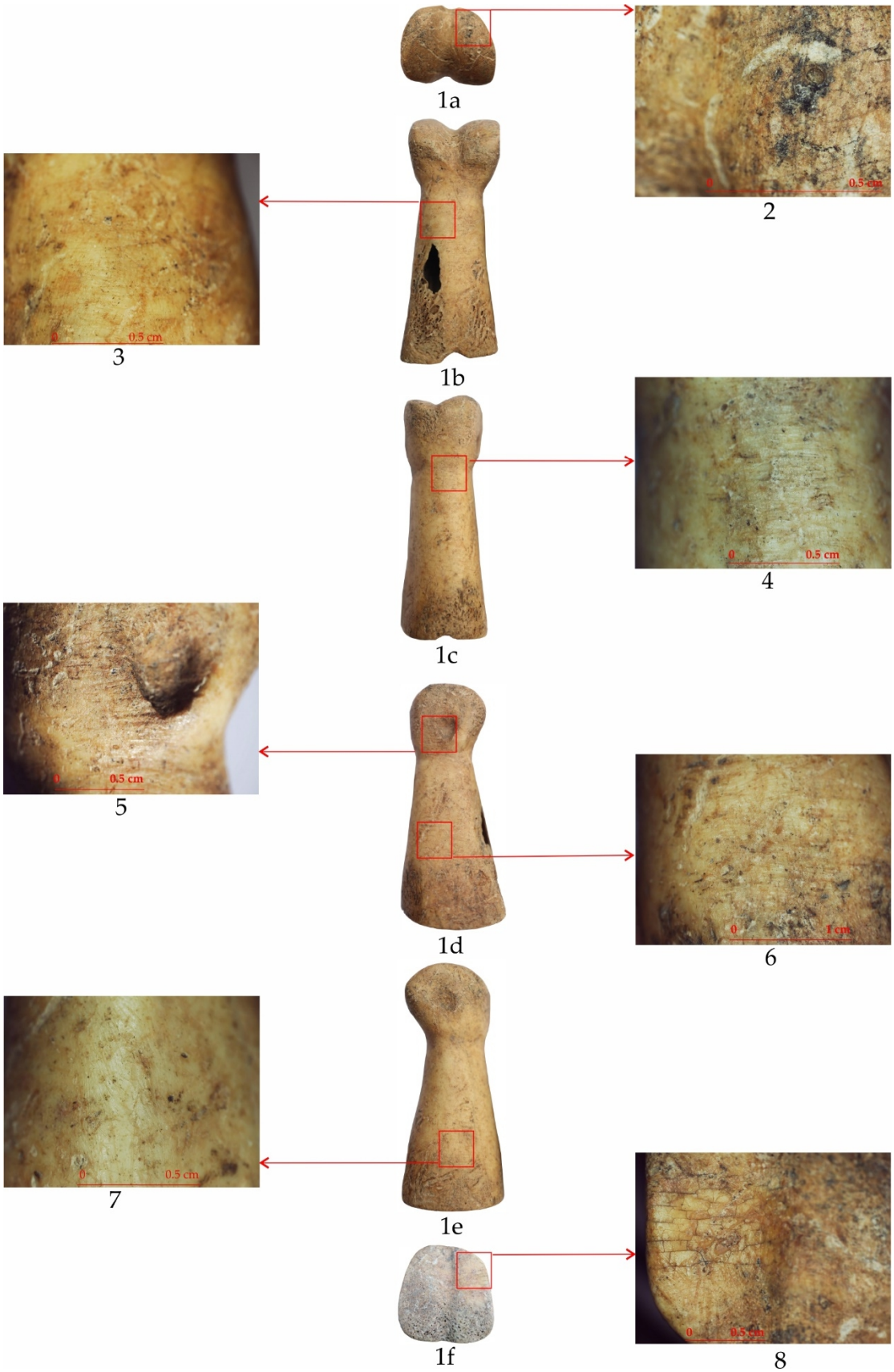
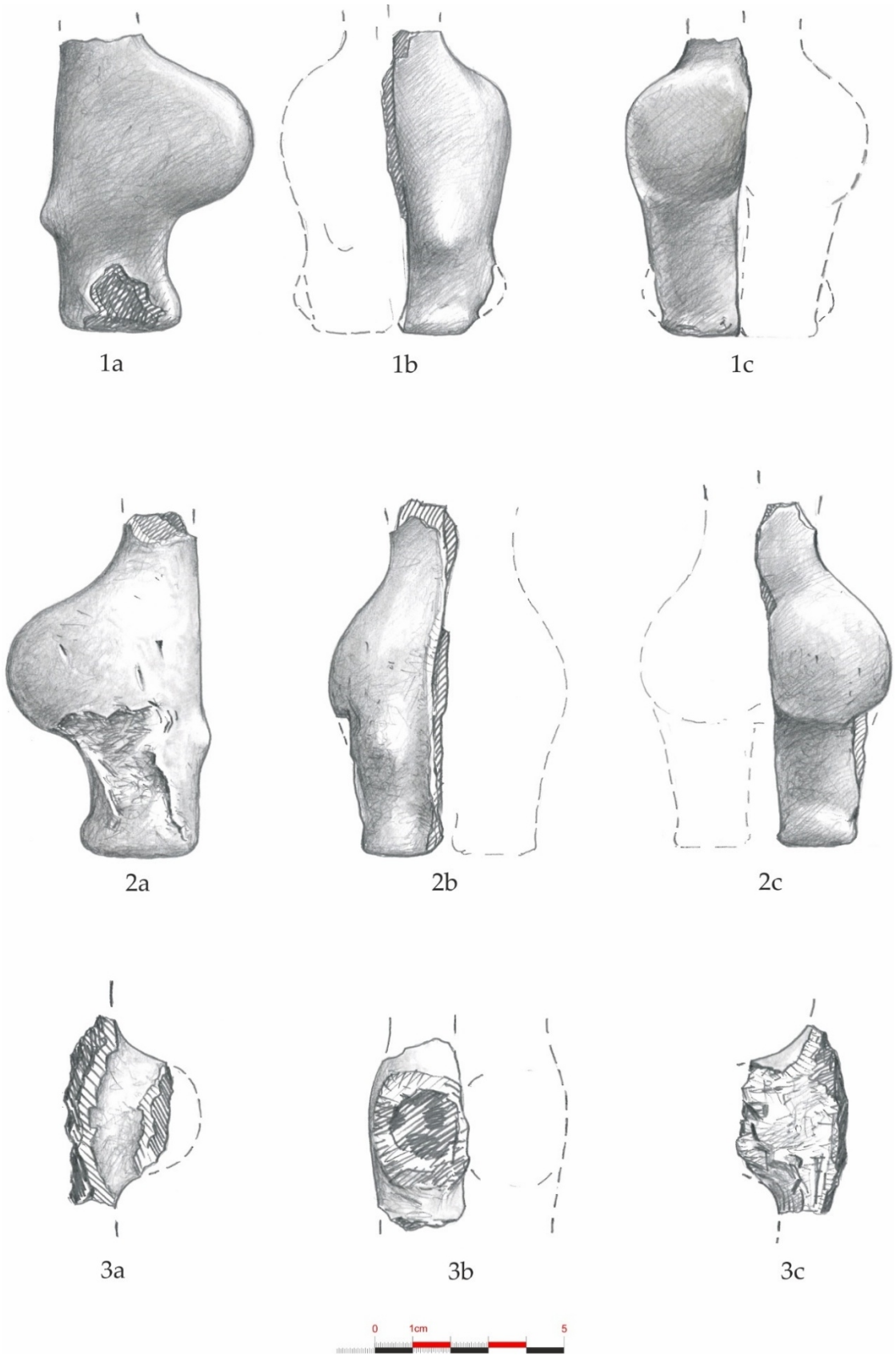
Pl. III. 1. Orthophotomap with area A of the Tărtăria *Pietroșița* site (2015), showing the location of feature Cx. 41A (modified after Google Earth); 2. Photograph of the pit-feature Cx. 41A from Tărtăria *Pietroșița* (photo: I.A. Bărbat).
1. Ortofotoplan cu zona A a sitului Tărtăria *Pietroșița* (2015), cu localizarea complexului Cx. 41A (prelucrare după Google Earth); 2. Fotografie cu locuința adâncită Cx. 41A de la Tărtăria *Pietroșița* (foto: I.A. Bărbat).



Pl. IV. 1-2. Early Neolithic figurine obtained from a cattle proximal phalanx, discovered in pit-house Cx. 41A from Tărtăria *Pietroșița* (3D scan: C. Șuteu).
1-2. Figurină neolitică timpurie obținută dintr-o falangă proximală de bovideu, descoperită în locuința adâncită Cx. 41A de la Tărtăria *Pietroșița* (scanare 3D: C. Șuteu).



Pl. V. 1-2. Macro- and microscopic photographs of the proximal cattle phalanx (photo: I.A. Bărbat).
1-2. Fotografii macro- și microscopice ale figurinei din falanga proximală de bovideu (foto: I.A. Bărbat).



Pl. VI. 1-2. Early Neolithic fragmented anthropomorphic clay statuettes, discovered also in Cx. 41A (drawing: M. Manea).
1-2. Statuete antropomorfe din lut neolitice timpurii, aflate în stare fragmentară, descoperite împreună cu figurina din os în Cx. 41A (desen: M. Manea).

Pl. VII. 1-3. Figurines made of equide phalanges, some with anthropomorphic elements, from the Neolithic sites of Dja'de el Mughara – 1a-1c (after Christidou *et alii* 2009), Tepecik-Çiftlik – 2a-2d (after Campana, Crabtree 2019) and Çatalhöyük – 3a-3d (after Pawłowska 2020).
1-3. Figurine confecționate din falange de ecvide, din care unele cu elemente antropomorfe, descoperite în siturile neolitice de la Dja'de el Mughara – 1a-1c (după Christidou *et alii* 2009), Tepecik-Çiftlik – 2a-2d (după Campana, Crabtree 2019) și Çatalhöyük – 3a-3d (după Pawłowska 2020).

Arrow shaft straighteners (?) from the Hamangia cemetery at Cernavodă *Columbia D*, Romania

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Constantin HAITĂ[**]

Abstract: *This study presents the analysis of six polishing tools, interpreted as possible arrow shaft straighteners, discovered at Cernavodă* Columbia D *together with other stone tools, the most representative group being the one of axes, adzes and chisels. This study presents all available data for the six items, concerning the context of discovery, typological and dimensional data, as well as considerations concerning the petrographic nature of the raw material. It is interesting that all analyzed items were made of the same type of rock, available in the area of the site. The analogies, especially with artefacts discovered south of the Danube, allowed the interpretation of the typology and function of these items in a broader context.*

Rezumat: *În acest studiu sunt prezentate rezultatele analizei unui lot de șase unelte de șlefuit, interpretate ca posibile șlefuitoare pentru tijele de săgeți. Acestea au fost descoperite în situl Cernavodă* Columbia D, *împreună cu alte piese de piatră, cel mai reprezentativ grup fiind acela al topoarelor, teslelor și dălților. Acest studiu prezintă toate datele disponibile, referitoare la contextul descoperirii, date tipologice și dimensionale, precum și considerații privind natura petrografică a materiei prime. Interesant este faptul că toate piesele analizate sunt realizate din același tip de rocă, disponibilă în aria sitului, putând avea o sursă locală. Analogiile prezentate, în special cu piesele descoperite la sud de Dunăre, au permis interpretarea funcționalității și tipologiei acestui tip de unealtă într-un cadru mai larg.*

Keywords: *arrow shaft straighteners, Late Neolithic, Hamangia culture, cemetery*
Cuvinte-cheie: *șlefuitoare de tije de săgeți, neolitic târziu, cultura Hamangia, cimitir*

◈ Introduction

Numerous artefacts pertaining to the lithic industry were found at Cernavodă *Columbia D* site, Constanța County, Romania, considered primarily a Late Neolithic burial ground attributed to the Hamangia culture. One of the most representative groups, polished stone tools (including axes, adzes, and chisels) have already been published (Kogălniceanu, Haită 2015), followed by the flint industry (Kogălniceanu *et alii* 2017). Others are waiting in line. Six abrading artefacts forming a coherent group, presumably functioning as arrow shaft straighteners, will be described and discussed below.

◈ Typology

Six abrading artefacts, elongated, half-oval in cross-section (five out of six), with a groove along the piece on the flat side were found at Cernavodă *Columbia D* (figs. 1 and 2).

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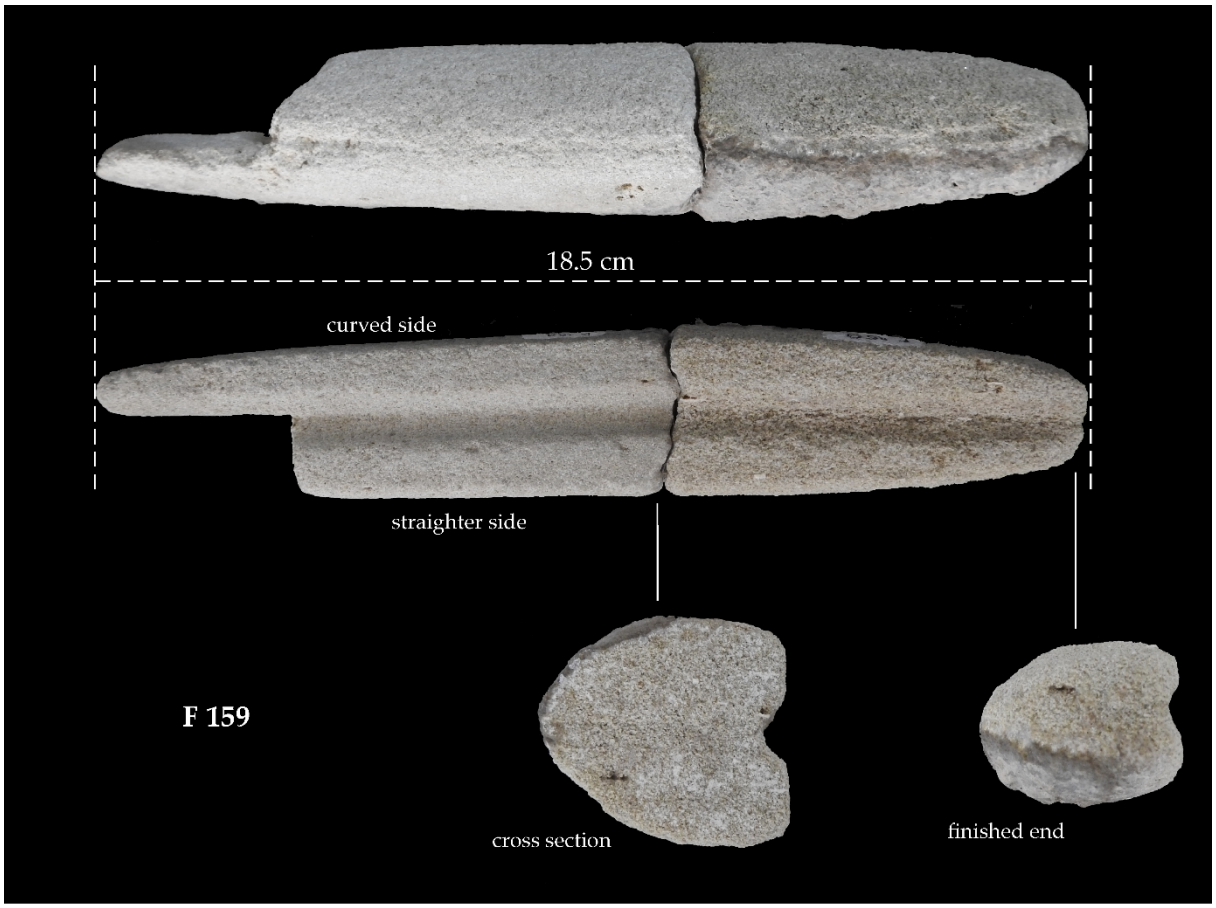

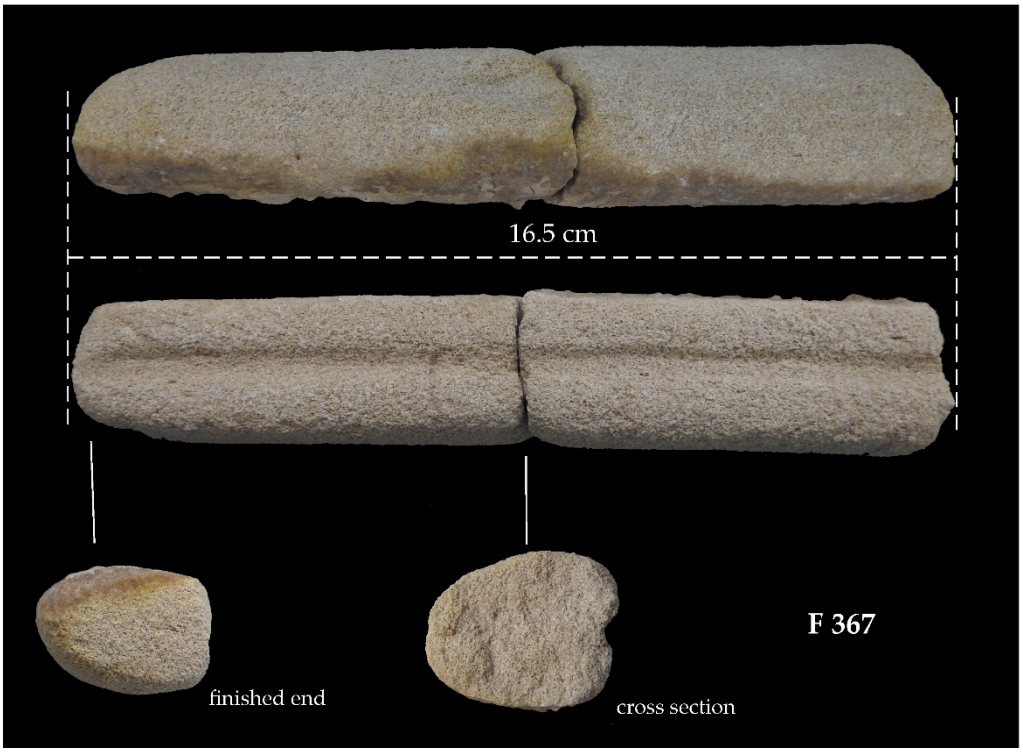

Fig. 1. The arrow shaft straighteners from Cernavodă *Columbia D* site. F 159 and F 367.
Șlefuitoarele de tije de săgeți din situl Cernavodă *Columbia D*. F 159 și F 367.

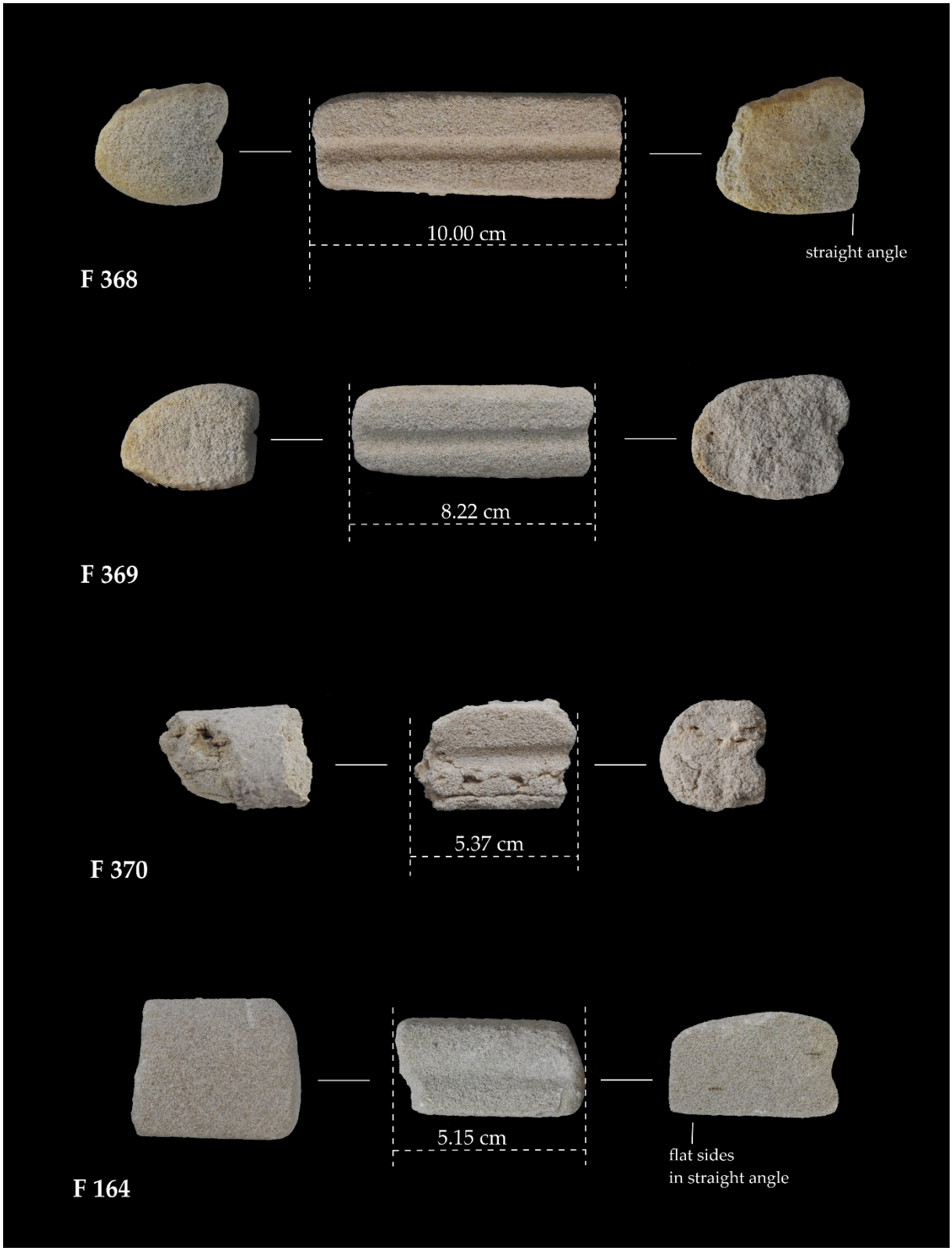

Fig. 2. The arrow shaft straighteners from Cernavodă *Columbia D* site. F 164, F 368, F 369 and F 370.
Șlefuitoarele de tije de săgeți din situl Cernavodă *Columbia D*. F 164, F 368, F 369 and F 370.

They are not complete pieces. In five cases, one end shows processing, while the other presents a breaking surface. The processed end is usually narrower than the rest of the artefact. Two items are formed by two adjoining fragments, but even these are not complete in length. Even so, two of the longest (incomplete artefacts) have 16.5 and 18.5 cm, while the smallest fragment has 5.37 cm, being broken at both ends (tab. 1).

Inv. no.	**F 159**	**F 164**	**F 367**	**F 368**	**F 369**	**F 370**
Toponym	Col D	Col D	Col D?	Col D?	Col D?	-
Year of discovery	-	1957	1960	1960	1960	-
Section	Collapsed area	UC/LC	Collapsed area?	Collapsed area?	Collapsed area?	*Passim*
Trench	-	S XB	-	-	-	-
Square	-	2	-	-	-	-
Material	Fine to medium texture carbonate sandstone, very well sorted, pale yellow (2,5 Y 8/3 Munsell color), very homogeneous, finely micaceous, with mm shells, fine porosity, moderately compact, slightly friable.					
Dimensions[1] (cm)	L(p) = 18.50 W = 2.51-3.57 Th = 1.46-3.27 Ø = 0.70	L(p) = 5.15 W = 4.42-4.51 Th = 2.75 Ø = 0.80	L(p) = 16.50 W = 2.95-3.80 Th = 2.18-3.25 Ø = 0.58	L(p) = 10.00 W = 3.00-3.54 Th = 2.50-3.39 Ø = 0.70	L(p) = 8.22 W = 3.45-3.86 Th = 2.33-3.14 Ø = 0.70	L(p) = 5.37 W = 3.46 Th = 3.59 Ø = 0.73
Shape	Semi-oval, with an indentation along the artefact	Rectangular, with an indentation along the artefact	Semi-oval, with an indentation along the artefact	Semi-oval, with an indentation along the artefact	Semi-oval, with an indentation along the artefact	Semi-oval, with an indentation along the artefact
Observations	2 fragments of the same artefact		2 fragments of the same artefact			Burned and cracked

Tab. 1. The archaeological context and the main features of the analyzed artefacts.
Contextul arheologic și principalele caracteristici ale artefactelor analizate.

The groove usually has a diameter of around 0.7 cm, being deeper or shallower on the half that was preserved.

There are some slight differences between artefacts. While F 159, F 367, F 369 and F 370 have a somehow symmetrical shape in cross-section, F 368 has a flat side, making a sharp angle with the side bearing the groove (fig. 2). The piece that distinguishes itself from the others is F 164, with a rectangular cross-section (fig. 2). It seems that this one might have been reused as an arrow shaft straightener after a different artefact was damaged beyond use in its primary function.

◈ Petrography

All six analyzed polished stone tools were realized using the same raw material. This is represented by a sandstone with carbonate cement, with fine to medium texture (fig. 3), very

[1]L(p) = preserved length, W = width, Th = thickness, Ø = diameter of the groove.

well sorted, pale yellow (2,5Y 8/3 Munsell color), finely micaceous, with very rare shell inclusions, mm dimensions, very homogeneous, with fine porosity, moderately compact, slightly friable.

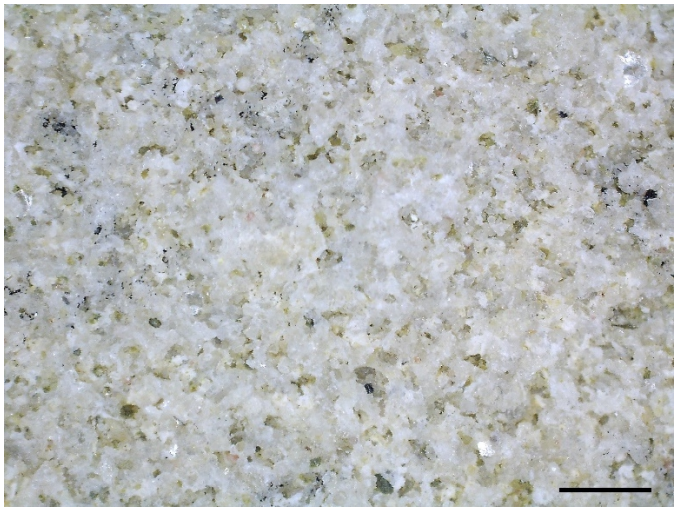

Fig. 3. Photo at stereomicroscope of one carbonate sandstone tool (F164); natural light, scale 1 cm.
Imagine la stereomicroscop a unei piese de gresie carbonatică (F 164); lumină naturală, scara 1 cm.

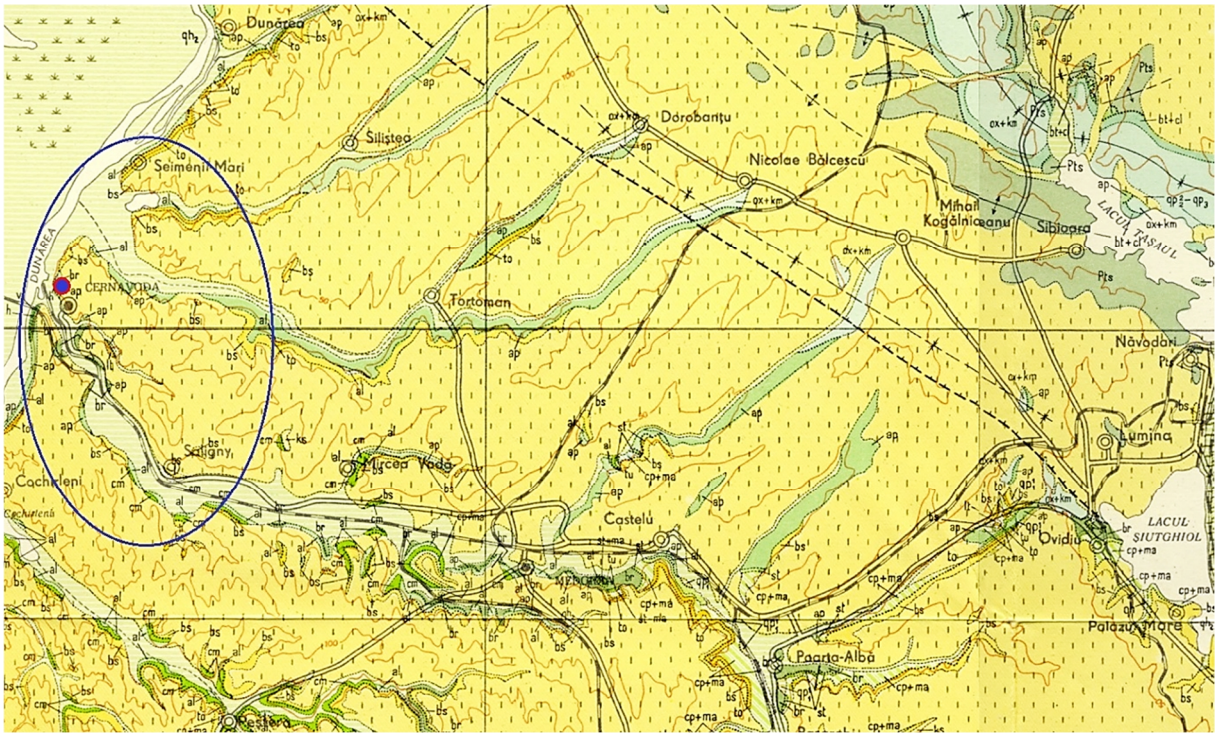

Fig. 4. Geological map with the location of the site and the occurrence of closest Cenomanian (cm) deposits (after Chiriac 1968a, modified).
Harta geologică, cu localizarea sitului și ocurențele celor mai apropiate depozite ale Cenomanianului (cm; după Chiriac 1968a, modificată).

We can appreciate that this type of rock is very suitable for an abrading tool, especially for softer materials. The fine granular structure and the moderate compaction determined by

the carbonate cement allow very good results, consisting of smooth and relatively uniform surfaces.

This type of rock is present in sedimentary deposits, of different ages, from Central and Southern Dobruja (Haită 2011, fig. 2). Carbonate sandstones of the Jurassic age occur in the area of Hârşova – Gălbiori – Tichileşti – Topalu localities, and to the south, in Dorobanţu – Mihail Kogălniceanu – Ovidiu area and alongside Casimcea Valley and in Cretaceous deposits known in the area of Hârşova – Ghindăreşti – Topalu – Capidava and Piatra – Cheia – Gura Dobrogei localities (Chiriac 1968b, p. 14-18).

The closest sources by the site from Cernavodă are represented by Cretaceous - Cenomanian deposits located in the Carasu Valley, between Medgidia and Saligny, at distances of about 10-15 km (Chiriac 1968b, p. 27; fig. 4).

◈ Contextualization of items

The location of items inside the site area

The cemetery of Cernavodă *Columbia D* had been divided by the archaeologists that excavated it, based on certain differentiating characteristics, into two main parts: the Upper cemetery and the Lower cemetery. North of these, two ravines had also been identified, in which the finds had the aspect of both ritual depositions and garbage disposals (Pits no. 1 and 2). Other materials were also excavated in the northwestern extremity of the site, named on the labels of various artifacts "the collapsed area" (for more details concerning the internal organization of the site, see the yearly excavation reports, and mainly Morintz *et alii* 1955). Based on the data published in all the excavation reports (Morintz *et alii* 1955; Berciu, Morintz 1957; 1959; Berciu, Morintz and Roman 1959; Berciu *et alii* 1961), and on a general plan containing the excavated sections, we compiled an approximate schema to illustrate the internal organization of the site (fig. 5).

Unlike other artefacts from the site area, these six items benefit from very little information concerning their location:

- one (F 159) comes from the northern part of the site, towards the Danube, known as "collapsed area"; graves have been reported here, but the piece was not marked with the indicative of any feature; we also do not have the field drawings from that area and the missing year of discovery makes it difficult to identify the item in the field notes (assuming it was noted down).

- another one (F 164) comes from the area that has characteristics of both Upper and Lower cemeteries; although the area is known for proper graves, we do not have information that the item was discovered in such a context; both field notes from the year of discovery and field drawings from the area are missing.

- for other three items (F 367, F 368 and F 369) we have only the year of discovery (1960) and the information that it was discovered at Cernavodă, without the mention of the exact area (*Columbia A*, *B*, *C*, *D* or *Sofia Hill*); according to the brief chronicle of excavations published yearly (Popescu 1961, p. 135), in 1960 excavations were carried out in the north-western part [*collapsed area*] of the cemetery area [*Columbia D*] and on Sofia Hill, but there only in the layers attributed to the Cernavodă culture.

- finally, a small fragment (F 370) has an unclear context of discovery, since it was identified in a box containing materials from various contexts at Cernavodă.

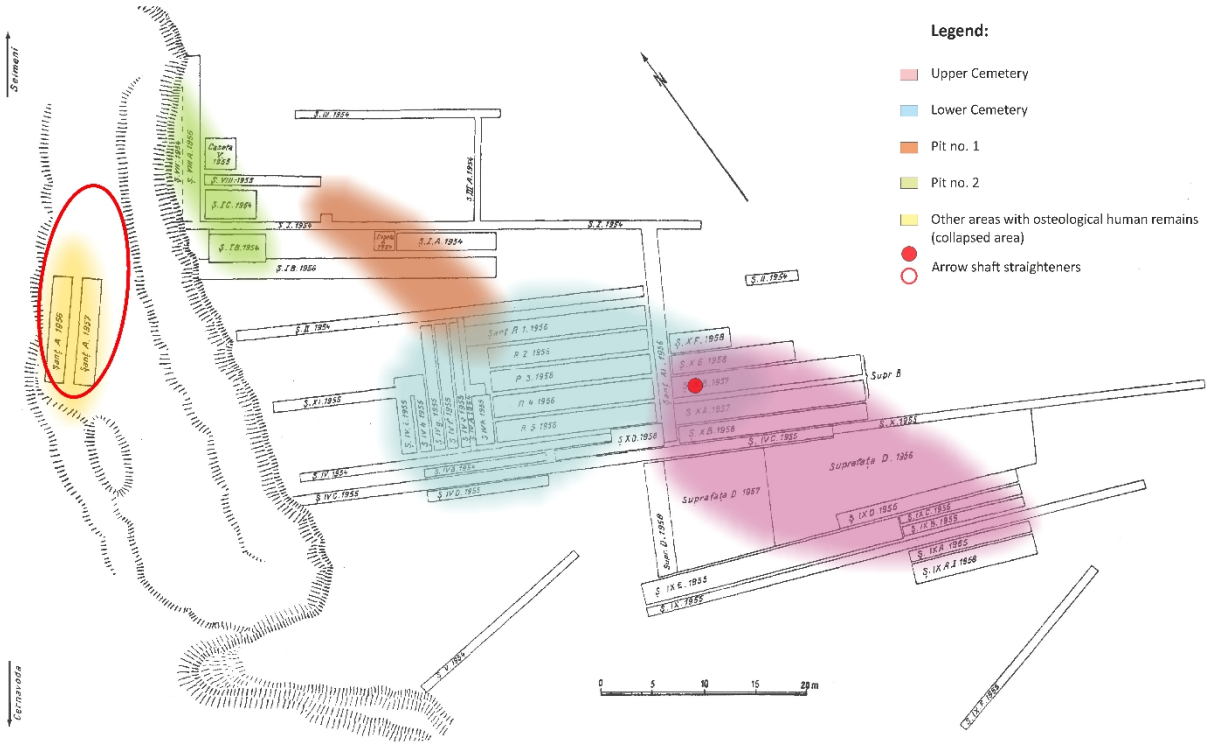

Fig. 5. Location of the arrow shaft straighteners inside the Cernavodă *Columbia D* site.
Localizarea șlefuitoarelor de tije de săgeți în cadrul sitului Cernavodă *Columbia D*.

As an overview, only one item was found in the cemetery proper area (F 164), while the other four were found in the collapsed area, in the vicinity of the so-called "ritual pits", an area with particular features, sometimes more characteristic to a settlement than to a cemetery area.

Other context-related issues

In the case of other artefacts from Cernavodă *Columbia D* we discussed the position of the items in relation to the anatomical elements of the skeleton, the sex and age of the deceased, and the association of the items with other types of grave goods. Obviously, this time it is impossible to approach any of these topics due to the scarcity of context data.

◈ Analogies

Hamangia culture settlements

Such to our surprise, this type of artefact has not been reported so far either in the various (few) excavation reports in Hamangia settlements on the territory of Romania (Morintz *et alii* 1955; Berciu, Morintz 1957; 1959; Berciu *et alii* 1959; 1961) or synthesis concerning the Hamangia culture (Berciu 1966; Hașotti 1997).

We know of only one such item, recovered at Baia *Golovița/Drumul Vacilor*, during the 2024 excavation in the settlement there (Carozza *et alii* 2024; unpublished artefact).

The Durankulak cemetery

The best analogies are illustrated in the Hamangia cemetery at Durankulak. Seven such items were reported there (fig. 6), coming from six different graves (Todorova 2002, vol. 2,

p. 11), one including two such items (Graves 95, 602, 607, 698, 725 and 1143) (Todorova 2002, vol. 2, p. 34, 61, 66, 67, 84 and Tabl. 8/13, 101/4,103/12 and 14, 122/7, 174/12). Three of the graves including arrow shaft straighteners were attributed, according to the catalogue, to the Hamangia I-II phase (Graves 95, 602 and 607) and three of them to the Hamangia III phase (Graves 698, 725 and 1143).

An interesting aspect is that, at Durankulak, they seem to be found mostly in pairs, pointing to the fact that a complete arrow shaft straightening device is composed of two opposing halves.

One of the items at Durankulak (Grave 725) included a complete half, having the following dimensions: L = 14.60 cm, W = 2.88 cm, Th = 3.12 cm, Ø = 0.8 cm. These measurements show that the arrow shaft straighteners from Durankulak are similar in size to those from Cernavodă.

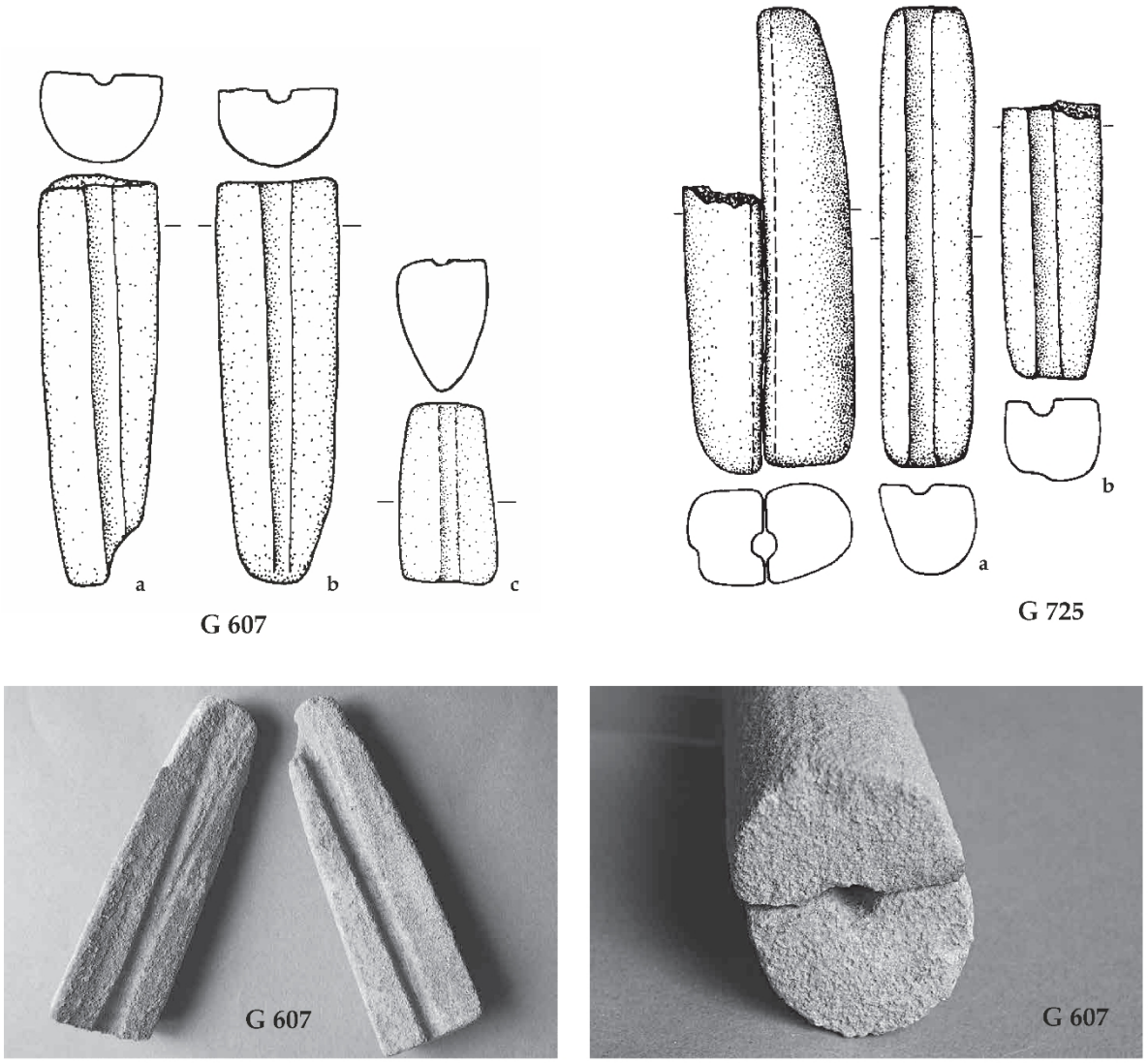

Fig. 6. Arrow shaft straighteners from Durankulak (Todorova 2002, vol. 1, fig. 249, vol. 2, pl. 103/12-13, 122/7). Șlefuitoare de tije de săgeți de la Durankulak (Todorova 2002, vol. 1, fig. 249, vol. 2, pl. 103/12-13, 122/7).

In terms of the association with the body in the grave, one of the graves was determined as a cenotaph, and another one was destroyed or at least poorly preserved. The other three graves contained the bodies of adult individuals, two males, one female, and one probably female, according to the anthropological determination. One of the items was placed on the chest of the deceased, between the hands (Grave 95), another one at the right knee (Grave 602), a third one at the right elbow (Grave 607), and in the fourth case at the right foot (Grave 725) suggesting there was no preferred location for this type of artefact in relation to the body.

It is worth commenting on the fact that, when analyzing stone tools from the cemetery, Kalin Dimitrov describes the arrow shaft straighteners as exclusively male items (Dimitrov 2002, p. 209), basing his assertion on the "archaeological" sexing of the individuals from the cemetery, which creates a vicious circle (the individual is male because of the type of grave goods, and certain grave goods are specifically male because they were found in archaeologically determined male graves!).

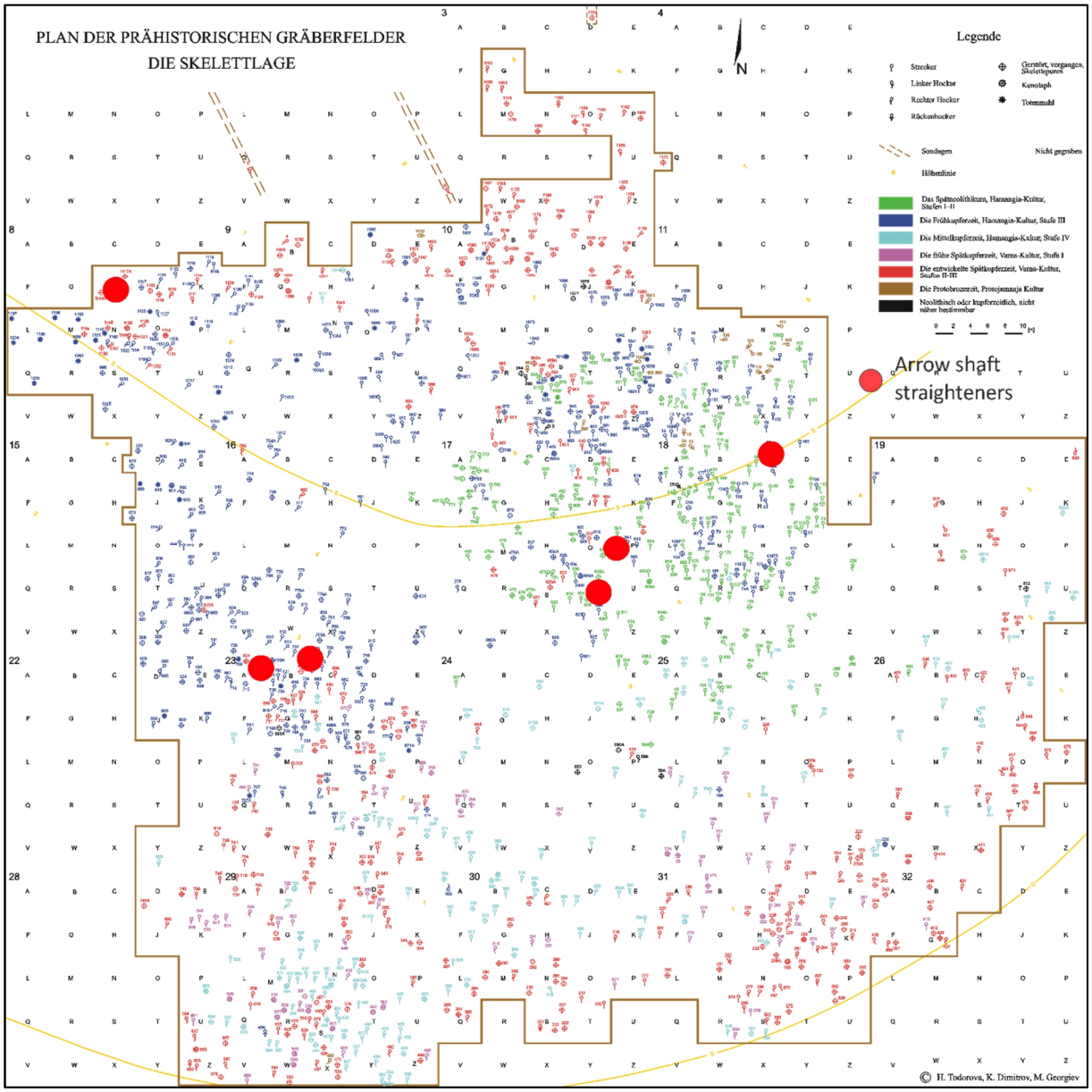

Fig. 7. Location of the arrow shaft straighteners inside the Durankulak site (base map after Todorova 2002). Localizarea șlefuitoarelor de tije de săgeată în situl Durankulak (planul de bază după Todorova 2002).

Another controversial assertion of Dimitrov is that most of the arrow shaft straighteners were found in graves from the incipient phases of the Hamangia culture (Dimitrov 2002, p. 209), while the catalogue, as shown above, attributes the graves in equal proportion to the Hamangia I-II and III phase.

It seems that in some cases, fragments from the arrow shaft straighteners were subsequently used as grinding tools (Dimitrov 2002, p. 209).

In terms of spatial distribution, it appears that there is no particular area of the cemetery where these artefacts were employed as grave goods (fig. 7).

Other sites

Three similar artefacts seem to have been found at Lepenski Vir. Two of them were found together, inside the same dwelling structure (a pair, as at Durankulak!), while the third was found between two houses (Antonović 2006, p. 71-72, catalogue nos. 52-54). The house where the pair was found (House 17) was attributed to settlement Ia / phase 1 at Lepenski Vir (Antonović 2006, p. 40), indicating a much earlier, Mesolithic tradition (first half of the 7th millennium BC (Radovanović 2000, fig. 3; Perić, Nikolić 2016, p. 72). Although, typologically, this kind of tool is mentioned in the volume on Neolithic ground stone industry in Serbia as type XI/4/b (Antonović 2003, p. 59, fig. 37), later in the volume, where sites are discussed in detail, this particular tool is no longer exemplified. Similar artefacts have been found at Ostrovu Mare *Km 873* (Iron Gates area), but we don't know the detailed context of discovery, or even the layer (with or without pottery) (Boroneanț 1983, fig. 1/2-3).

A similar artefact was found together with numerous geometric flint artefacts in a possible Late Neolithic cenotaph grave at Halmeu *Vamă* (Satu Mare County) (Astaloș, Virag 2006-2007, 75-77, pl. V). The association of the mentioned artefacts is important, as we will explain later on.

This type of tool was also illustrated as a traditional grave good in case of Bronze Age Catacomb culture graves (Brjussow 1957, p. 288, Abb. 68/7), although, in this case it looks as manufactured from a different material, other than sandstone. Unfortunately, we do not have additional information.

◈ Discussion

Arrow shaft straighteners seem to be a particular tool in the objects inventory of the Hamangia communities.

For one thing, they seem to be present more in the cemetery areas than in settlements, or at least the published information for the Late Neolithic seems to point in this direction.

In the case of the items from Serbia, the artefacts of this type were interpreted as grinding stones with narrow grooves on the work surface probably for processing bone awls and needles (Antonović 2003, p. 59) and put under the same functional group with a few other types of grinding artefacts (fig. 8). The drawings are generic, to illustrate the general shape of the stone tools. The illustration of the grooves though, as on real items, suggest a different use for type XI/4/b from types XI/4a, c and d.

While the groove on items similar to ours is from one end of the stone tool to the other and has a regular shape, in the other three cases the grooves are more than one on one artefact, shorter, irregular in size and have a pointed end. Without going into too much detail, we want to say that types a, c and d suggest indeed their use as tools for processing bone awls and

needles, the grooves on them being the result of this process (the act of sharpening the tip of the new tool and not necessarily of straightening its body). On the other hand, artefacts like ours and like that illustrated under type XI/4/b have the active side and the groove on it prepared in advance for the subsequently processing of bone or wood (most probably wood). In addition, and in favor of the prior preparation of the active surface(s) is the fact that these so-called arrow shaft straighteners are to be used in pairs and not singularly as the other three illustrated types in fig. 8. This prior preparation that should be explored into more detail and through experimental studies is also suggested by the way the two halves seem to perfectly combine. They do so both at the outside part of the combined tool, with the sides aligning perfectly and making the tool easy to hold in one hand and in what concerns the groove, that seems also to be aligned perfectly on the two halves, even without being perfectly centered on the stone pieces (observations made on the paired items from Grave 607 at Durankulak, see fig. 6 in this study). The extremities and the exterior sides of the two halves look also prepared in advance. All these are in clear opposition to the classic tip sharpeners illustrated in fig. 8 (types XI/4/a, c and d) where only the raw material of the stone tool is important for its abrasive properties and not the shape of the artefact.

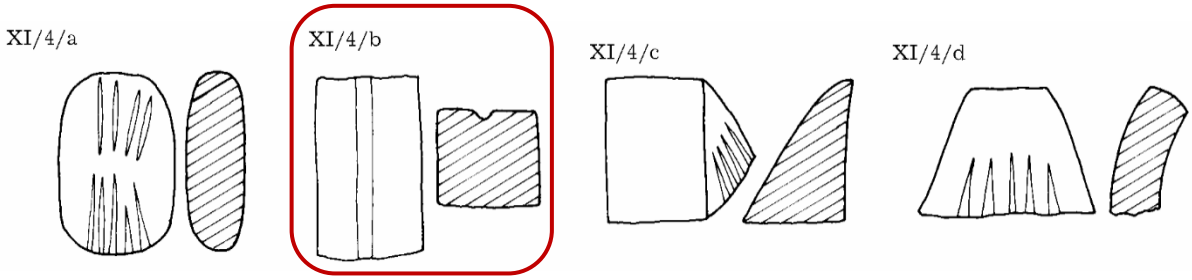

Fig. 8. Types of grinding artefacts used for obtaining other tools (after Antonović 2003, pl. 37).
Tipuri de unelte de șlefuitpentruobținereaunoralteunelte (dupăAntonović 2003, pl. 37).

Another interesting aspect is the absence of arrow heads, both in cemeteries where the so-called arrow shaft straighteners were found, and in the settlements. The large number of boar heads or other wild animal body parts from the Hamangia cemetery at Cernavodă, together with the wild animal remains from settlement areas suggests that hunting plays a certain role in the economy and beliefs of the Hamangia communities (Necrasov *et alii* 1959; Necrasov, Haimovici 1962; Haimovici 1987; 1998-2000; Bălășescu, Radu 2002-2003; Haimovici, Bălășescu 2006; Bălășescu 2008). None the less, classic arrow heads are missing. Other types of projectiles might have been used, such as some small geometrical flint items discovered at Ceamurlia de Jos (Berciu 1966, p. 186, fig. 91/7, 10). Their use as arrowheads is beautifully demonstrated by a discovery made in Turkey (Alpaslan-Roodenberg 2011).

Another possible explanation for the presence of such items could be that they were used for manufacturing long wooden sticks suitable for a different kind of activity, other than hunting, maybe some kind of long wooden needles. This would also explain the association of the stone tool with women's graves at Durankulak, although it is not a given fact that manufacturing arrow shafts was an activity to be performed only by men, as implied in the Durankulak monographic volumes.

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Date geomorfologice și sedimentologice privind formarea *tell*-ului Bordușani *Popină*

Constantin HAITĂ*

Abstract: *The archaeological research of the* tell *settlement Bordușani* Popină *was carried out in some important stages, determined by the overall stratigraphy of the site, but also by the envisaged objectives. The levels attributed to the Gumelnița culture were investigated by surface excavations, as was that of the upper part, on the late Getic levels, from the La Tène epoch.*

The investigated surfaces, marked with "α", respectively with "β", were initially separated by a four meter wide bench, noted "γ".

Starting in 1993, as in the case of the Hârșova tell *site, with the beginning of the multidisciplinary archaeological program, sedimentological and micromorphological research was also initiated. This aimed, first of all, to understand the geomorphological framework of the site, the sedimentological and microstratigraphical characterization of the archaeological levels, and their micromorphological analysis. Thus, they targeted both the settlement itself and the surrounding area.*

As part of a broader research theme on the origin and dynamics of tell*-type settlements in Muntenia and Dobrogea, the sedimentological research at this important site took into account the geomorphological context of the settlement, the presence of planning or/and delimitation structures, as well as its overall stratigraphy and chronology.*

The methodology adopted consisted of the sedimentological analysis of the stratigraphic profiles from the archaeologically analyzed surfaces, the analysis of sedimentary successions from small sondages, carried out at the lower limit of the Eneolithic levels, as well as the analysis of data obtained through soil core drilling, complemented by the analysis of continuous, undisturbed successions, sampled using a mechanical percussion corer. These data were, each time, integrated into the archaeological research of the site and supplemented with information obtained through radiocarbon dating.

This article presents the main results of this research, in an attempt to outline a synthesis of the information on the main stages of formation of this important tell*.*

Rezumat: *Cercetarea arheologică a* tell*-ului Bordușani* Popină *a fost efectuată în câteva etape importante, determinate de stratigrafia de ansamblu a sitului, dar și de obiectivele avute în vedere. Investigarea nivelurilor atribuite culturii Gumelnița a fost realizată prin săpături în suprafață, ca și aceea de la partea superioară, asupra nivelurilor getice târzii, din epoca La Tène. Suprafețele cercetate, marcate cu „α", respectiv cu „β", au fost inițial separate de un martor cu lățimea de patru metri, notat cu „γ".*

Începând cu anul 1993, ca și în cazul sitului Hârșova Tell*, odată cu începerea programului arheologic pluridisciplinar, au fost inițiate și cercetările sedimentologice și micromorfologice. Acestea au avut în vedere, în primul rând, înțelegerea cadrului geomorfologic al sitului, caracterizarea sedimentologică și microstratigrafică a nivelurilor arheologice, dar și analiza micromorfologică a acestora. Astfel, acestea au vizat atât așezarea în sine, cât și zona înconjurătoare.*

Parte integrantă a unei teme de cercetare mai largi, referitoare la originea și dinamica așezărilor de tip tell *din Muntenia și Dobrogea, cercetarea sedimentologică din acest important sit a avut în vedere contextul geomorfologic al așezării, prezența unor structuri de amenajare sau/și delimitare, precum și stratigrafia de ansamblu și cronologia acesteia.*

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Metodologia adoptată a constat în analiza sedimentologică a profilelor stratigrafice din suprafețele cercetate arheologic, analiza succesiunilor sedimentare din cadrul unor mici sondaje, realizate la limita inferioară a nivelurilor eneolitice, precum și analiza datelor obținute prin carotaje cu sonda de soluri, completată cu analiza succesiunilor continue, în stare nederanjată, prelevate cu ajutorul carotierei cu percuție mecanică. Aceste date au fost, de fiecare dată, integrate în cercetarea arheologică a sitului și completate cu informațiile obținute prin datările radiocarbon.

În acest articol sunt prezentate principalele rezultate ale acestor cercetări, în încercarea de a contura o sinteză a datelor referitoare la principalele etape de formare ale acestui important tell.

Keywords: *geomorphology, sedimentology, Eneolithic, Gumelnița culture,* tell *type settlement*

Cuvinte-cheie: *geomorfologie, sedimentologie, eneolitic, cultura Gumelnița, așezare de tip* tell

◈ Introducere

Așezările pluristratificate de tip *tell* din Muntenia și Dobrogea sunt caracteristice culturilor Boian și Gumelnița, fiind încadrate cronologic în perioada 4900-3900 cal BC. În cazul *tell*-ului Bordușani *Popină*, locuirea eneolitică este atribuită exclusiv culturii Gumelnița (Marinescu-Bîlcu 2005, p. 10). Aceasta este suprapusă de cele două niveluri de locuire getică atribuite culturii La Tène, încadrate cronologic în perioada sec. II BC - I AD. În nivelurile posterioare locuirii gumelnițene, au fost descoperite un mormânt sarmatic și materiale din prima epocă a fierului (Hallstatt B) (Marinescu-Bîlcu 2005, p. 10).

Tell-urile pot fi definite ca așezări de forma unei movile, cu contur oval sau circular, cu diametre maxime de 200 m, suprafață locuită bine delimitată și stratigrafie amplă, exprimată prin niveluri de locuire succesive, fiind caracterizate și prin organizarea internă a spațiului locuit. Succesiunile stratigrafice sunt alcătuite din unități sedimentare atribuite unor locuințe incendiate sau neincendiate, structuri anexe, zone de pasaj, zone destinate unor activități diverse, zone de deșeuri menajere, tranșee și gropi (Haită 2012).

Aceste așezări sunt localizate de-a lungul principalelor râuri, fiind amplasate atât pe marginile teraselor, pe prelungiri sau proeminențe ale acestora, cât și în luncă, pe martori de eroziune (popine, grădiști) sau grinduri, pe malurile unor lacuri sau chiar pe insule din interiorul acestora.

Tell-ul de la Bordușani are diametre maxime de 180 m pe direcția nord-sud și 70 m pe direcția est-vest, și o înălțime relativă față de terenul din jur de cca 15,40 m (Marinescu-Bîlcu 2005, p. 10).

Cercetările sedimentologice din *tell*-ul Bordușani *Popină* au avut în vedere analiza zonei în care a fost amplasat situl, contextul geomorfologic al acestuia, dar mai ales analiza microstratigrafică a structurilor arheologice cercetate. Alături de aceasta din urmă, analiza micromorfologică a permis detalierea modului de organizare a spațiului construit (organizarea internă a unor locuințe), structurarea spațiului locuit din așezare (prezența zonelor de pasaj, a zonelor de activitate și a zonelor menajere), ca și utilizarea unor materii prime specifice mediului natural înconjurător (Haită 1997; 2001; 2003; 2012).

Fiind localizată pe un martor de terasă, constituit din depozite cu textură siltică de tipul *loess*-ului, majoritatea elementelor constructive din cadrul așezării sunt realizate din acest tip de sedimente. Alături de acestea, lutuielile succesive fine, cu grosimi milimetrice, amenajate atât pe podea, cât și pe pereții structurilor construite, sunt constituite în multe cazuri din silturi și nisipuri fine de origine aluvială. Prezența amprentelor vegetale de tipul stufului și papurei în cadrul materialelor preparate, dar și în cazul unor cuverturi vegetale, ca și a unităților de

cenușă fină din cadrul nivelurilor de distrugere, ce provin de la arderea acoperișului locuinței, indică utilizarea plantelor specifice unei zone umede.

◈ Date cartografice și geomorfologice

Tell-ul Bordușani *Popină* este situat în zona de luncă internă a Dunării, areal care se dezvoltă în aval de localitatea Călărași, unde fluviul își schimbă cursul spre nord, între Câmpia Română, spre vest, și zona mai înaltă a Dobrogei, spre est. În cadrul acestui sector, ostrovul Balta Ialomiței este urmat, după reunirea celor două brațe în zona Giurgeni-Vadu Oii, de ostrovul Balta Brăilei (denumit Insula Mare a Brăilei, după delimitarea prin diguri) și continuat cu Delta Dunării (fig. 1). Această câmpie aluvială largă, cu altitudine relativă de 5-7 m deasupra nivelului apei, a cărei lățime poate depăși uneori 10 km, se caracterizează prin soluri, vegetație și microtopografie caracteristice (Banu 1967). Formele de microrelief negative sunt reprezentate prin lacuri, bălți temporare (japșe), canale și cursuri de apă temporare (privale), iar cele pozitive prin grinduri, dune, insule și popine. Popinele sunt martori de eroziune ai unui nivel mai înalt, cu altitudine egală sau apropiată de terasa joasă, fiind inundate doar la viituri foarte mari.

Fig. 1. Localizarea *tell*-ului Bordușani *Popină* pe harta geografică a României (www.freeworldmaps.net). The location of the *tell* Bordușani *Popină* on the geographical map of Romania (www.freeworldmaps.net).

Din punct de vedere geologic, zona este alcătuită din depozite de tip *loess* de vârstă Pleistocen mediu-superior și Holocen inferior – ce suprapun roci mai vechi, care apar la zi pe largi suprafețe din teritoriul Dobrogei –, aluviuni fine de vârstă Holocen (argile, silturi și nisipuri fine) și nisipuri eoliene, separate prin orizonturi de paleosol (Liteanu, Chiriac 1967).

Comuna Borduşani este situată pe malul stâng al Braţului Borcea, zona având ca substrat geologic depozitele de *loess* predominant nisipoase, uşor siltice (prăfoase), din alcătuirea terasei joase (fig. 2). Acest nivel de terasă apare pe o zonă îngustă, ce se întinde de la sud de Borduşani până la nord de Făcăeni. Spre vest, în aceeaşi perioadă geologică, au fost acumulate depozite nisipoase eoliene ce sunt întâlnite pe o zonă largă, situată la sud de râul Ialomiţa, depăşind spre vest teritoriul oraşului Slobozia.

În cadrul luncii și deltei Dunării, cele mai importante așezări gumelnițene de tip *tell* sunt situate atât în zona inundabilă, pe martori de *loess* (Bordușani *Popină*, Vlădeni *Popina Blagodeasca*, Maliuc *Taraschina*), cât și pe marginea terasei joase (Hârșova *Tell*) sau pe promontorii ale terasei înalte (Cernavodă *Tell*-ul *Schuchhardt*). Dintre acestea, așezările Bordușani *Popină* și Hârșova *Tell* prezintă stratigrafia cea mai amplă și corespund primelor două tipuri de amplasament menționate.

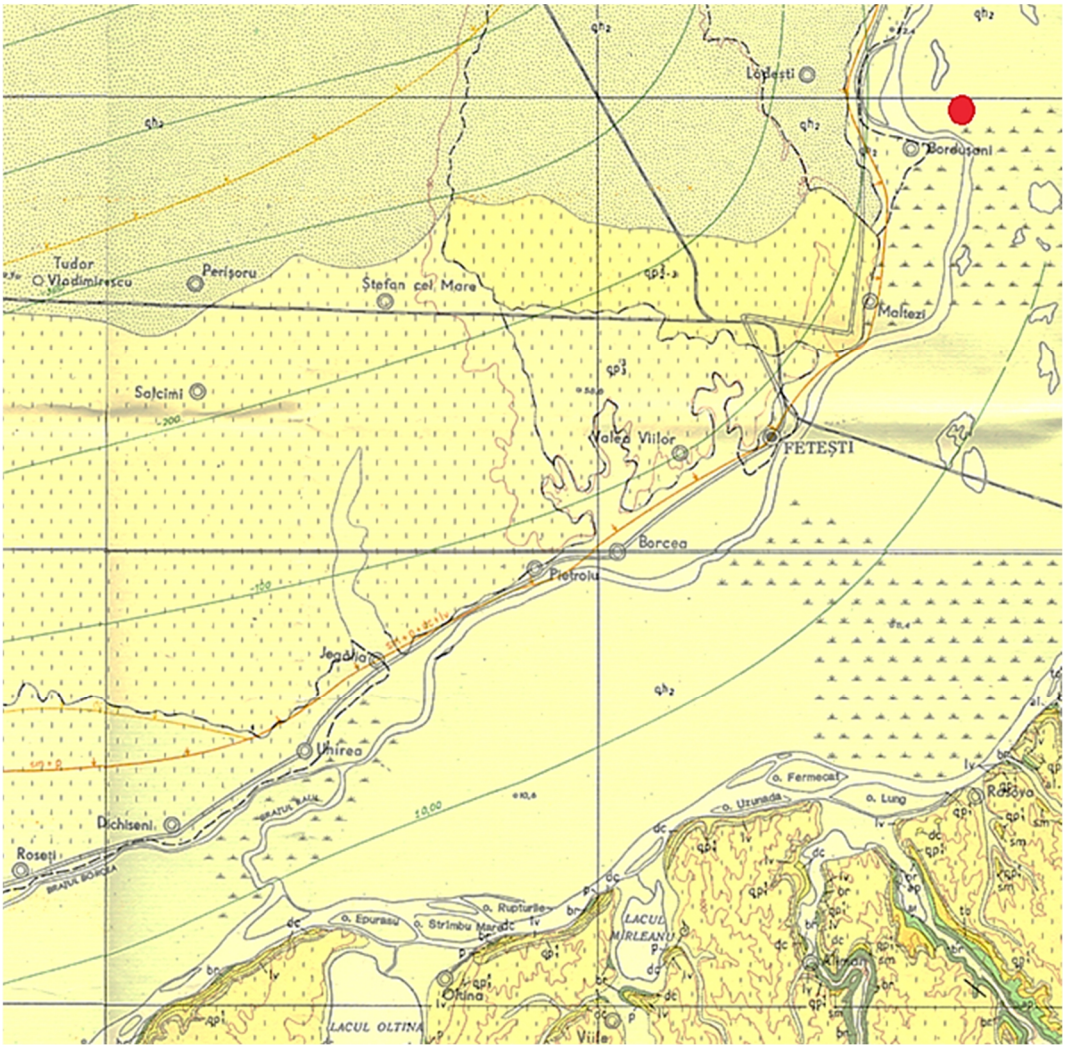

Fig. 2. Localizarea *tell*-ului Bordușani *Popină* pe harta geologică a României, scara 1:200000, foaia Călărași; după Liteanu, Chiriac 1967, cu modificări.
The location of the *tell* Bordușani *Popină* on the geological map of Romania, scale 1:200000, Călărași map sheet; after Liteanu, Chiriac 1967, with modifications.

Cercetările pluridisciplinare realizate în aceste două situri permit elaborarea unor comparații și integrarea datelor în cadrul locuirii gumelnițene din lunca Dunării. Cercetări de

paleomediu detaliate sunt necesare și importante pentru înțelegerea mai bună a evoluției mediului natural și a contextului acestor locuiri în raport cu marele fluviu.

Aşa cum am menționat, așezarea de tip *tell* Borduşani *Popină* este situată în ostrovul Balta Ialomiţei, zonă cu aspect insular din alcătuirea luncii Dunării, delimitată de braţul Borcea, la vest, şi Dunărea Veche, la est, în vecinătatea digului vestic, cu orientare generală nord-sud. Cercetările sedimentologice efectuate în situl arheologic Borduşani *Popină* au confirmat faptul că aşezarea de tip *tell* este situată pe un martor de eroziune al terasei joase, cu o altitudine relativă de cca 5,40 m, față de nivelul actual al luncii (Haită 2005).

Analiza hărţilor geografice disponibile a evidențiat faptul că zona din cadrul luncii Dunării în care este situată *Popina* de la Bordușani a suferit schimbări importante în timp, ca urmare a evoluţiei geomorfologice, fiind mai puţin afectată de lucrările de desecare şi îndiguire din ultima jumătate de secol. Pe harta „Specht" este marcată prezenţa Braţului Borcea, un canal aluvial ce pornea din zona Maltezi şi făcea legătura, pe direcţia SV-NE, între Borcea și Dunăre (fig. 3). Nu este foarte sigură relevanţa acestui canal, deoarece pe hărţile ulterioare nu mai este reprezentat, întreaga zonă de luncă fiind sugestiv desenată ca un mozaic de arii inundate, separate prin zone mai înalte, cu vegetaţie caracteristică.

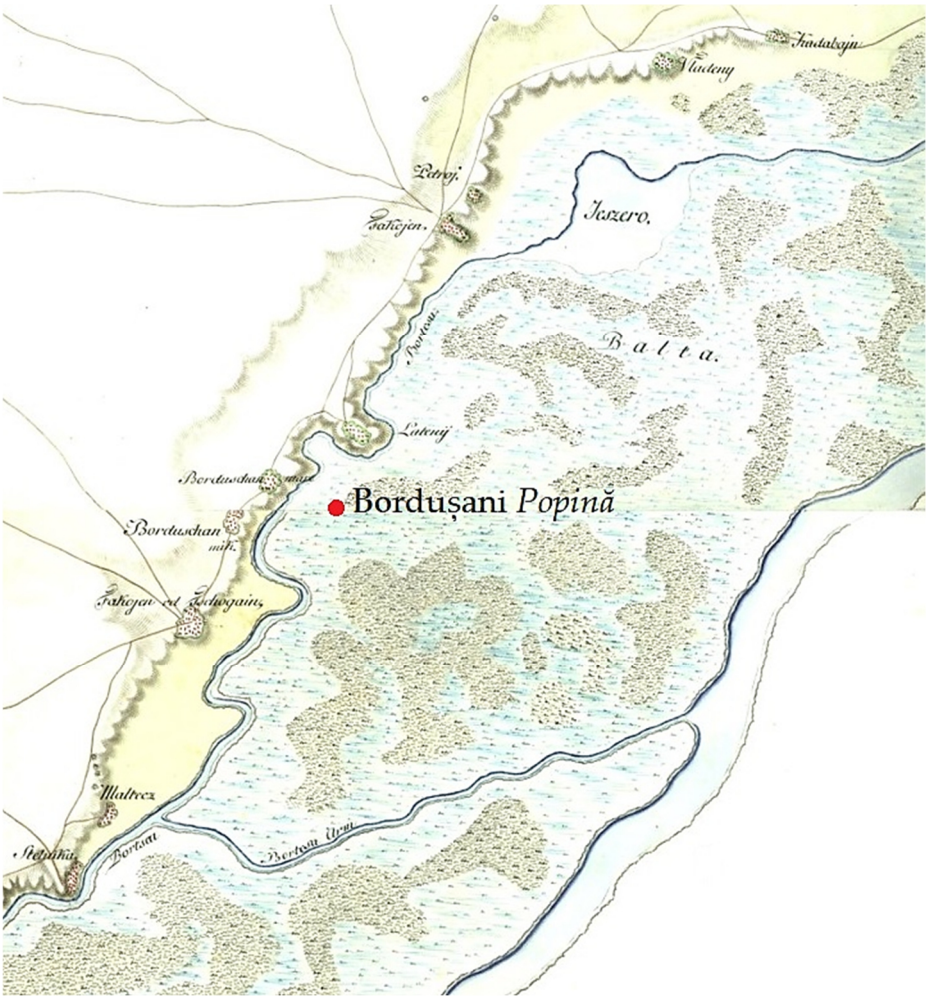

Fig. 3. Localizarea *tell*-ului Bordușani *Popină* pe harta „Specht", 1791, scara 1:57600, foaia 108, cu modificări.
The location of the *tell* Bordușani *Popină* on the "Specht" map, 1791, scale 1:57600, map sheet 108, with modifications.

Pe harta „Szathmari" (fig. 4) este marcată movila ce reprezintă *Popina* Borduşani, precum și cele trei lacuri din imediata vecinătate a acesteia. *Bentul Mic*, deşi ca poziţie este redat la o distanță mult mai mică față de braţul Borcea decât este în realitate, este sugestiv reprezentat ca făcând parte din aceeaşi zonă sedimentară ca şi ostrovul Borcei, sugerând etape succesive în evoluţia sedimentologică. *Bentul Mare* este conectat spre nord, printr-o reţea de canale, cu lacul *Popina* şi cu un important canal cu direcţie N-S, *Sâltava de Jos*, ce leagă lacul *Cobollu*, din apropierea Dunării, cu zona din vecinătatea nordică a Hârşovei, unde cele două braţe se unesc. În vecinătatea estică a *Popinei* Borduşani, se poate observa un alt lac, de dimensiuni mai mici, conectat cu lacul *Popina* printr-un canal ce traversează o zonă mlăştinoasă, în zona centrală a luncii. Important de menţionat este şi faptul că zona înconjurătoare a *Popinei* Borduşani nu este reprezentată ca o zonă mlăştinoasă, iar în marginea ei estică, la numai câteva sute de metri, este reprezentat un important canal aluvial, ce uneşte malul Borcei cu zona mlăştinoasă din nord.

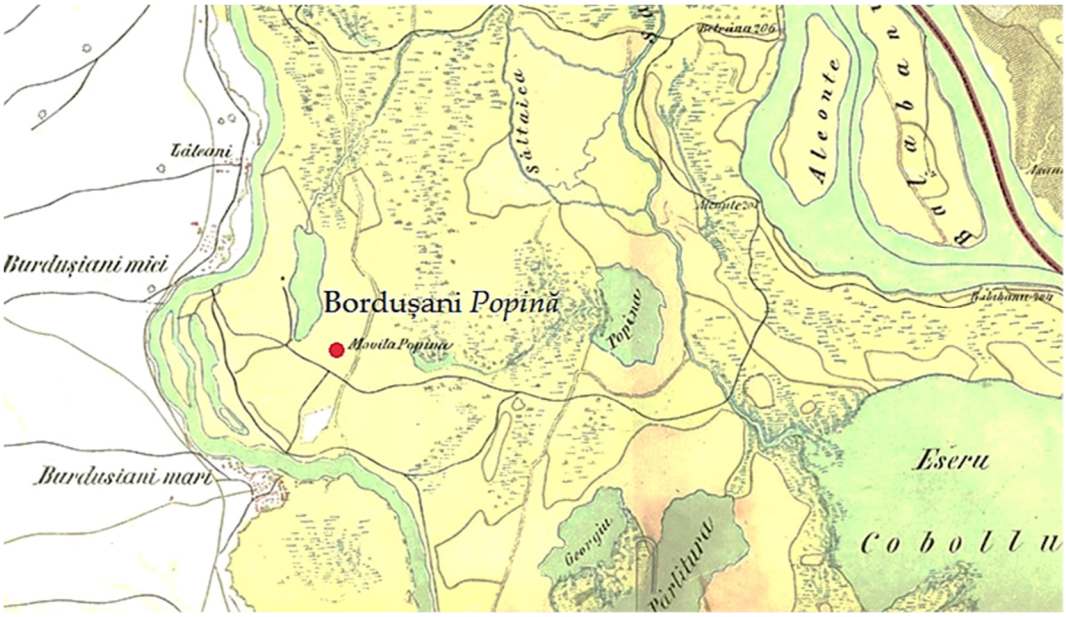

Fig. 4. Localizarea *tell*-ului Bordușani *Popină* pe harta „Szathmari", 1864, scara 1:57600, coloana VIII, seria 6, cu modificări.
The location of the *tell* Bordușani *Popină* on the "Szathmari" map, 1864, scale 1:57600, column VIII, series 6, with modifications.

Harta topografică militară cunoscută sub numele *Planurile Directoare de Tragere*, realizată la scara 1:20000, ale cărei măsurători au fost efectuate începând cu sfârşitul secolului al XIX-lea, ilustrează o situaţie mult mai apropiată de cea actuală, excepţie făcând modificările importante determinate de intervenţiile antropice din secolul al XX-lea. Pe această hartă, sunt marcate cele două lacuri din vecinătatea *Popinei Borduşanii Mici* (aşa cum este menționată pe această hartă), *Bentul Mic* şi *Bentul Mare*, fiecare dintre acestea incluzând în partea centrală câte o zonă insulară (fig. 5). Trebuie menţionat faptul că în vecinătatea estică a sitului este marcat canalul aluvial ce străbate această zonă de luncă pe o direcţie de la sud la nord, menţionat anterior, precum şi numeroase canale de mai mică extindere, în zonele situate la nord și la sud. În apropierea malului Borcei, între cele două lacuri este figurat un canal mai mic, în zona denumită *La Cot*.

Interesant este faptul că şi pe această hartă, aşa cum apare reprezentată pe harta „Szathmari", microzona în care este situată *Popina* Borduşani se evidenţiază ca un teritoriu mai înalt, cursurile de apă fiind în strânsă legătură cu cele trei lacuri, dar şi cu canalul aluvial ce separă spre est această parte a luncii.

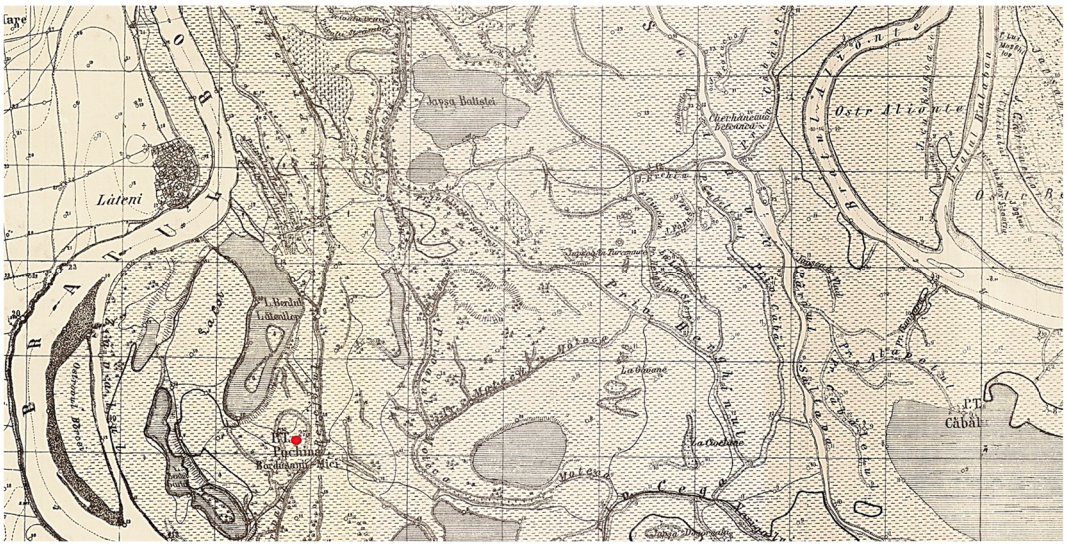

Fig. 5. Localizarea *tell*-ului Bordușani *Popină* pe „Planurile Directoare de Tragere", 1930, scara 1:20000, foile Făcăieni și Maltezi, cu modificări.
The location of the *tell* Bordușani *Popină* on the"Directory Firing Plans", 1930, scale 1:20000, map sheets Făcăieni and Maltezi, with modifications.

Harta topografică realizată la scara 1:25000 de Direcția Topografică Militară, tipărită în anul 1960, ilustrează acelaşi context geomorfologic pentru această microzonă, însă de această dată zonele cu frecvente lacuri, japşe şi canale, de la nord şi sud, sunt separate prin unul dintre primele diguri realizate în această parte a luncii Dunării (fig. 6).

◈ Problematica și metodologia cercetării sedimentologice

În scopul înțelegerii modului de formare a așezării de tip *tell* Bordușani *Popină*, în perioada 1998-2018 au fost efectuate o serie de cercetări sedimentologice, ale căror principale rezultate sunt sintetizate în cele ce urmează.

Primele cercetări sedimentologice, care au avut în vedere observații asupra cadrului geomorfologic al așezării, au fost realizate în campania de cercetări arheologice din anul 1998 și au constat în trei sondaje de mici dimensiuni, notate S I - S III. Acestea au fost realizate: în zona de nord-est a *tell*-ului, la baza succesiunii nivelurilor arheologice (S I), în baza unei gropi utilizată ca ghețărie, situată în zona de sud a popinei (S II), respectiv în zona de luncă, la baza popinei, în zona de nord est (S III)[1]. Aceste prime rezultate au fost publicate într-un studiu care include reprezentarea unei secțiuni ipotetice prin așezarea Bordușani *Popină* (Haită 2005).

[1] Aceste sondaje au fost realizate împreună cu domnii Radu Coman (Muzeul Județean Ialomița), Mihai Tomescu și Dragoș Moise (la acea dată, specialiști ai MNIR), cărora le mulțumim și cu această ocazie.

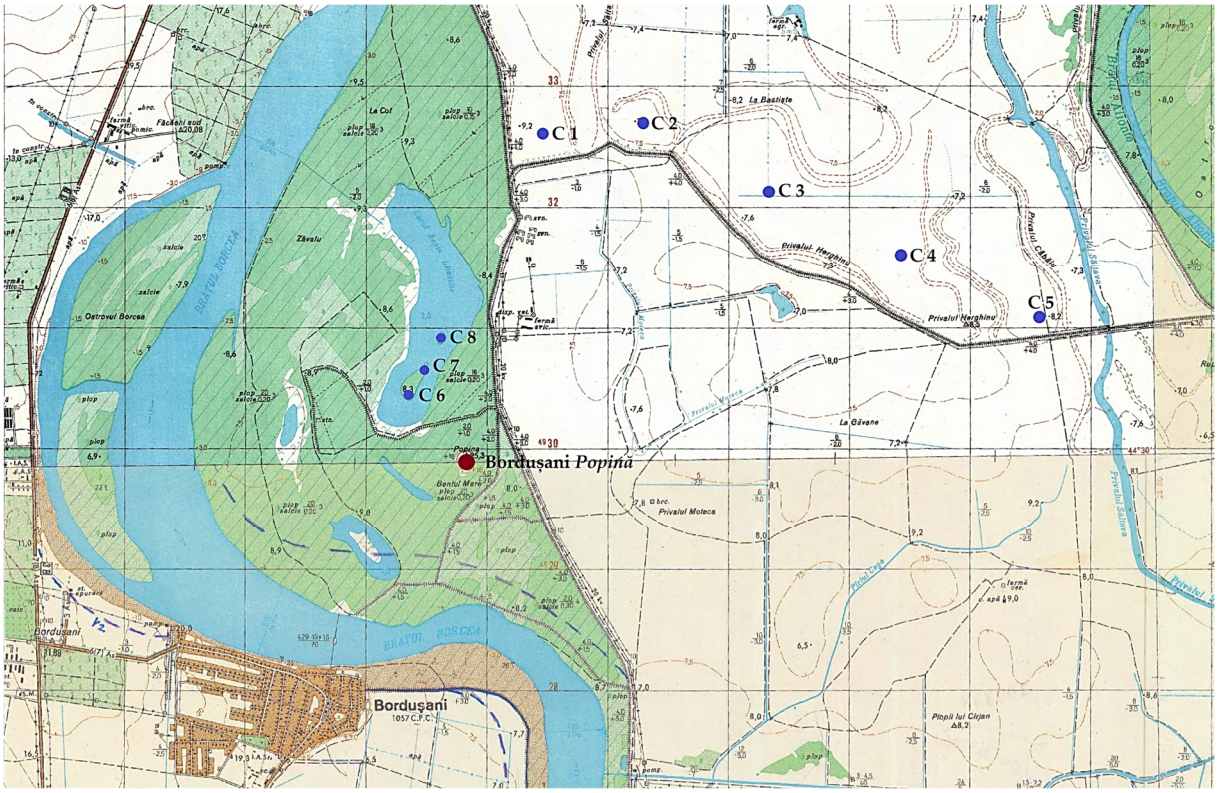

Fig. 6. Localizarea *tell*-ului Bordușani *Popină* pe harta topografică, Direcția Topografică Militară, 1960, scara 1:25000, foile Făcăieni și Bordușani, cu modificări. C 1 - C 8, carotaje cu sonda de soluri.
The location of the *tell* Bordușani *Popină* on the topographic map, Military Topographic Division, 1960, scale 1:25000, map sheets Făcăieni and Bordușani, with modifications. C 1 - C 8, soil auger corings.

O primă serie de carotaje cu sonda de soluri a fost realizată în campania de cercetări arheologice din anul 2005, pe un aliniament situat imediat la sud de marginea ghețăriei, pe panta sudică a popinei, pentru a documenta prezența locuirii antropice în această zonă, denumită *Popina Mică*. Au fost realizate cinci carotaje sedimentologice, până la adâncimea de 1,40 m, acoperind astfel întreaga pantă sudică a popinei.

Cercetări sistematice, în întreaga microzonă, au fost realizate în perioada 2011-2016, cadrul logistic fiind asigurat prin finanțarea unui proiect de cercetare *IDEI*[2]. În această etapă, au fost realizate și carotaje test, cu sonda de soluri, în zonele din vecinătatea popinei, în diferite contexte geomorfologice (*Bentul Mare*, *Bentul Mic*, *Grădiștea Stoicii*). Carotaje cu carotiera cu percuție mecanică (Haită 2020, p. 228) au fost practicate atât în zona de luncă, în vecinătatea popinei, cât și în așezare, pe un aliniament orientat N-S.

De asemenea, în cadrul proiectului de cercetări arheologice, o secțiune de mare amploare (notată S I Est) a fost realizată în partea de nord-est a popinei, fiind analizată pluridisciplinar: arheologic, microstratigrafic, micromorfologic și datată prin metoda radiocarbon. Într-o etapă finală, sondaje de mică amploare au fost realizate pe celelalte laturi ale așezării, fiind notate corespunzător: S II Vest, S III Sud, S IV Nord, completate în aceeași zonă nordică cu S V Nord și S VI Nord.

[2] Proiectul UEFISCDI – IDEI *Modele de co-evoluție între om și mediu în zona umedă a Bălții Ialomiței* (PN-II-ID-PCE-2011-3-0982) a fost coordonat de domnul Dragomir-Nicolae Popovici, a cărui plecare dintre noi, mult prea timpurie, o regretăm.

◈ Principalele rezultate obținute

Carotajele cu sonda de soluri

Zona exterioară

1. Prima zonă din exteriorul așezării în care au fost realizate carotaje test, în campania de cercetări din anul 2011, în scopul înregistrării stratigrafiei generale a depozitelor naturale și identificării unor posibile zone de locuire, este situată imediat la nord de digul ce străbate transversal Balta Ialomiței, situat la cca 2,5 km spre nord de *Popină*. Cele cinci carotaje sunt situate pe un aliniament orientat vest - est, paralel cu digul menționat (fig. 6, C 1 - C 5). Au fost testate zonele cu microrelief pozitiv, fiind înregistrată și microtopografia acestora[3].

Depunerile din această zonă de luncă, analizate pe o adâncime de 1,40 m, prezintă aceeași stratigrafie, alcătuită, după orizontul de sol arat cu o grosime de 30-40 cm, din niveluri de sedimente aluviale cu textură siltică, siltică argiloasă și nisipoasă fină, de culoare brun cenușiu mediu (10YR 5/2), brun gălbui (10YR 5/6) și gălbui (10YR 7/6), omogene, moderat compacte, fără constituenți antropici. Sporadic, au fost identificate fragmente ceramice atribuite perioadei romane și evului mediu, chiar la suprafața solului actual, dar și în orizontul de sol menționat. În lipsa identificării unui nivel de locuire, acest material arheologic a fost interpretat ca rezultat al amestecului de sedimente provenind din diferite contexte geomorfologice, în perioada realizării digului.

2. Un alt context sedimentar analizat prin această metodă expeditivă, dar cu rezultate foarte bune în stabilirea stratigrafiei de ansamblu, îndeosebi în etapa inițierii cercetărilor dintr-o anumită zonă (Haită 2020, p. 228), este reprezentat de insula din lacul *Bentul Mare*. Foarte interesant de notat este faptul că rezultatele indică în mod cert că această insulă este constituită din depozite de *loess* din alcătuirea unui martor de eroziune, în timp ce insula lacului *Bentul Mic* este constituită din depozite nisipoase, reprezentând un grind de tipul celui denumit *Ostrovul Borcei*, figurat pe harta topografică, de dată mult mai recentă. În acest caz, cele trei carotaje, dispuse pe un aliniament orientat nord - sud, în zona centrală a insulei (fig. 6, C 6 - C 8), până la adâncimea de 1 m, au furnizat o stratigrafie identică, alcătuită din:

- 0-35/40 cm: silt fin nisipos, bine sortat, brun mediu (10YR 4/3), omogen, moderat compact, cu structură agregată și frecvente rădăcini actuale, ce reprezintă orizontul organic al solului actual.
- 35/40-65 cm: silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), foarte omogen, moderat compact, cu structură agregată fină și frecvente impregnații organice brun închis (10YR 3/3), fără constituenți antropici (c. a.), ce reprezintă un orizont de tranziție al solului actual.
- 65-100 cm: silt nisipos gălbui (10YR 7/6), foarte bine sortat, foarte omogen, compact, cu structură granulară fină, fără c. a., ce reprezintă o acumulare naturală de tip *loess*, în cadrul unui martor de eroziune.

3. Cea de a treia zonă cercetată cu sonda de soluri, situată la cca 12,5 km sud de *Popină*, constituie un alt martor de eroziune, denumit *Grădiștea Stoicii*[4]. În acest context geomorfologic favorabil locuirilor antropice, cele trei carotaje realizate pe un aliniament poziționat în partea

[3] La aceste cercetări de teren au participat domnii Mihai Florea (MNIR), Florin Vlad și Radu Coman (Muzeul Județean Ialomița), cărora le mulțumim și pe această cale.

[4] Din punct de vedere geografic, *grădiștea* reprezintă un martor de eroziune (*popină*) ce păstrează indicii ale unei vechi locuiri umane.

centrală a grădiștei, au indicat aceeași stratigrafie ca și în cazul insulei din lacul Bentul Mare, cu diferența că orizontul solului actual este mult mai eterogen, fiind perturbat atât de rădăcinile arbuștilor, dar și de numeroasele vizuini de (micro-) mamifere sălbatice. Nici în această zonă nu au fost identificate materiale arheologice.

Facem aici precizarea că în cadrul zonei *Grădiștea Mare*, pe care este situată necropola de la Stelnica atribuită, ca și așezarea getică de la partea superioară a *Popinei*, epocii La Tène, au fost identificate fragmente ceramice eneolitice atribuite culturii Boian.

Zona interioară

Așa cum am menționat, la limita sudică a așezării, în campania de cercetări arheologice din anul 2005, a fost realizată o serie de cinci carotaje[5], situate pe un aliniament cu orientare nord - sud, la interval de cca 2 m distanță (fig. 7, C 1 - C 5), până la adâncimea de 1,40 m, în scopul precizării stratigrafiei generale a sitului în această zonă, ce era denumită în acea perioadă „*Tell*-ul mic". Succesiunea sedimentară înregistrată în această zonă poate fi prezentată astfel:

- 0-40 cm, nivel siltic fin nisipos, moderat sortat, brun cenușiu mediu (10YR 5/2), eterogen, foarte compact, cu rare granule de chirpici ars, câteva fragmente ceramice rulate și granule de pietriș fin, ce reprezintă orizontul organic al solului actual, format, parțial, pe o acumulare de tipul unui coluviu.
- 40-60 cm, nivel siltic cu nisip și pietriș fin, moderat sortat, brun cenușiu deschis (10YR 6/2), omogen, moderat compact, fără c. a.
- 60-90/95 cm, nivel siltic cu nisip fin, bine sortat, brun închis (10YR 3/3/), omogen, foarte compact, fără c. a.; reprezintă, foarte probabil, un orizont de paleosol.
- 90/95-140 cm, nivel siltic fin nisipos, foarte bine sortat, gălbui (10YR 7/6), omogen, compact, fără c. a. Reprezintă o acumulare naturală de tip *loess* din alcătuirea martorului de eroziune.

Succesiunea prezentată a indicat, în mod cert, că în această zonă nu există locuire antropică, materialele sporadice identificate doar în nivelul de sol actual fiind acumulate natural, pe pantă, dar și ca urmare a intervențiilor antropice moderne.

Carotajele cu percuție mecanică

Zona exterioară

1. Aceste cercetări mai ample, referitoare la zona din exteriorul așezării eneolitice, au demarat odată cu proiectul *IDEI* menționat. Astfel, după un prim carotaj, realizat pe malul vestic al râului Borcea, în comuna Bordușani, în depozitele de *loess* din alcătuirea terasei joase, următorul carotaj cu percuție mecanică, cu un echipament Cobra TT, a vizat zona situată imediat la sud de Popină, la marginea drumului forestier, la limita zonei împădurite, imediat la nord de curba de nivel 9 m (fig. 7). Acest carotaj, realizat cu carotierul deschis, cu diametrul de 50 mm, a fost notat cu C 2.

[5] Aceste carotaje sedimentologice au fost realizate împreună cu domnul Ionuț Fronescu (la acea dată, colaborator al MNIR), căruia îi mulțumim și aici.

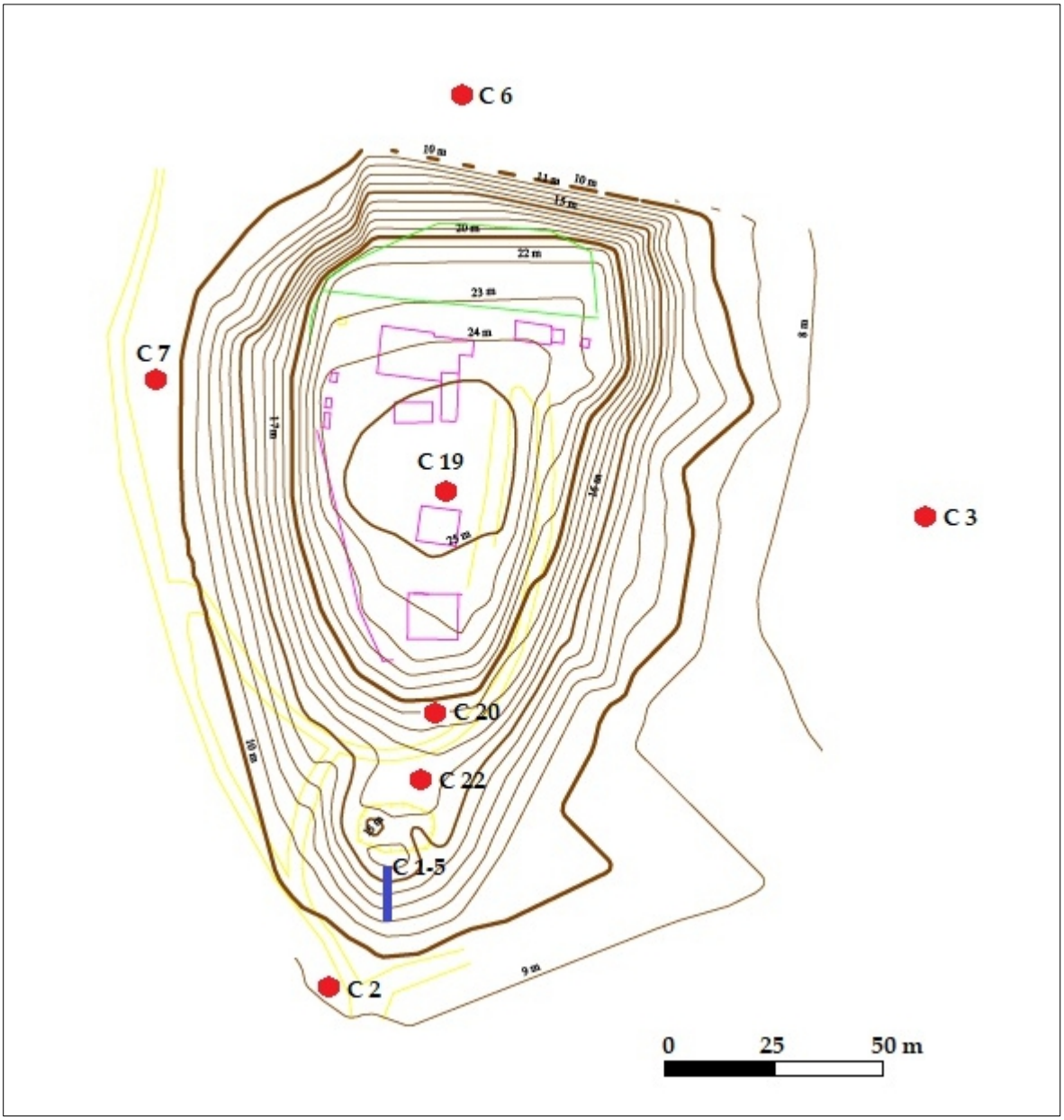

Fig. 7. Localizarea carotajelor sedimentologice cu percuție mecanică pe planul topografic al sitului arheologic Bordușani *Popină* (autor T.C. Miron, 2014).
The location of sedimentological corings with percussion on the topographic map of the archaeological site Bordușani *Popină* (author T.C. Miron, 2014).

Succesiunea sedimentară înregistrată poate fi sintetizată astfel:

- 0-15 cm, silt fin, bine sortat, brun mediu (10YR 4/3), cu structură agregată fină, relativ omogen, cu frecvenți constituenți organici și rădăcini actuale; orizont organic al solului actual.

- 15-53 cm, silt argilos, bine sortat, brun gălbui (10YR 5/6), cu structură prismatică fină, omogen, compact, cu constituenți organici fini; orizont organo-mineral al solului actual.

- 53-271 cm, silt cu nisip fin, moderat sortat, brun gălbui (10YR 5/6) și gălbui (10YR 7/6), cu structură fin granulară, ușor eterogen, compact, cu rare pete de oxizi de fier și granule carbonatice fine; include rari c. a. fini: granule de chirpici ars și fragmente de scoici cu dimensiuni mm, un fragment ceramic; nivel de acumulare aluvială.

- 271-450 cm, nisip fin, bine sortat, brun gălbui (10YR 5/6) și gălbui (10YR 7/6), ușor eterogen, compact, cu structură granulară fină, cu mica fină și impregnații cenușiu verzui (5GY 6/1) și brun închis 10YR 3/3), fără c. a.; nivel de acumulare aluvială.

- 450-480 cm, silt argilos, bine sortat, brun gălbui (10YR 5/6), foarte omogen, compact, fără c. a.; nivel de acumulare aluvială.

- 480-651 cm, nisip fin și silt, bine sortat, brun deschis (10YR 6/3) și gălbui (10YR 7/6), cu aspect eterogen, compact, cu rare impregnații feruginoase cenușiu verzui (5GY 6/1), fără c. a.; nivel de acumulare aluvială.

- 651-710 cm, nisip fin-mediu și silt, bine sortat, brun mediu (10YR 4/3), cu structură agregată medie, foarte omogen, foarte compact, fără c. a.; foarte probabil, corespunde nivelului de paleosol.

- 710-900 cm, silt și nisip fin, bine sortat, gălbui (10YR 7/6), foarte omogen, foarte compact; nivel de acumulare de tip *loess* din alcătuirea martorului de terasă.

Această succesiune corespunde unor acumulări aluviale fine, în zona de luncă inundabilă, ce suprapun la adâncimea de 6,51 m, un micro-relief format pe depozitele de *loess* din Pleistocen superior. Corespunzător ultimelor etape de locuire ale *Popinei*, sunt acumulați constituenți antropici fini, remaniați din zona așezării, doar la partea superioară a secvenței.

2. Cel de al doilea carotaj mecanic, realizat în zona din vecinătatea așezării, în aceleași condiții tehnice ca și C 2, este notat cu C 3 (fig. 7) și este situat în proximitatea estică a *Popinei*, la cca 30 m est de curba de nivel 8 m, în zona unei japșe de mici dimensiuni, observată și pe hărțile mai vechi, încă activă în prezent. Această zonă a fost cercetată ulterior și cu ajutorul unui carotaj tubat, în succesiune continuă, în stare nederanjată, notat cu C 9. Succesiunea sedimentară înregistrată în aceste carotaje (fig. 8) poate fi sintetizată astfel:

- 0-21 cm, argilă siltică, bine sortată, brun cenușiu închis (10YR 4/2), omogenă, moderat compactă, cu structură agregată și frecvente fragmente organice; nivel de sol actual format pe aluviuni.

- 21-169 cm, argilă siltică, bine sortată, brun gălbui (10YR 5/6), omogenă, compactă, cu pete de oxizi de fier, ce include fragmente de cochilii și rare concrețiuni carbonatice; nivel de acumulare aluvială.

- 169-308 cm, silt argilos, bine sortat, brun gălbui (10YR 5/6) și galben roșcat (7,5YR 6/8), omogen, compact, cu pete de oxizi de fier; nivel de acumulare aluvială.

- 308-450 cm, silt argilos gălbui (10YR 7/6), omogen, compact, cu paiete fine de mica și impregnații feruginoase cenușiu verzui (5GY 6/1) și galben roșcate (7,5YR 6/8) și foarte rare concrețiuni feruginoase mm; nivel de acumulare aluvială.

- 450-470 cm, silt argilos cu nisip fin, bine sortat, cenușiu verzui (5GY 6/1), omogen, compact, cu mica fină și frecvente cochilii de gasteropode; nivel de acumulare aluvială.

- 470-541 cm, argilă fină, foarte bine sortată, cenușiu verzui deschis (5GY 7/1), omogenă, compactă, fără c. a., cu niveluri fine de lamine cu frecvente cochilii; nivel de acumulare aluvială.

- 541-554 cm, argilă fină, bine sortată, cenușiu verzui deschis (5GY 7/1), omogenă, compactă, cu fragmente fine de cochilii și granule fine de chirpici ars; nivel de acumulare aluvială ce remaniază c. a.

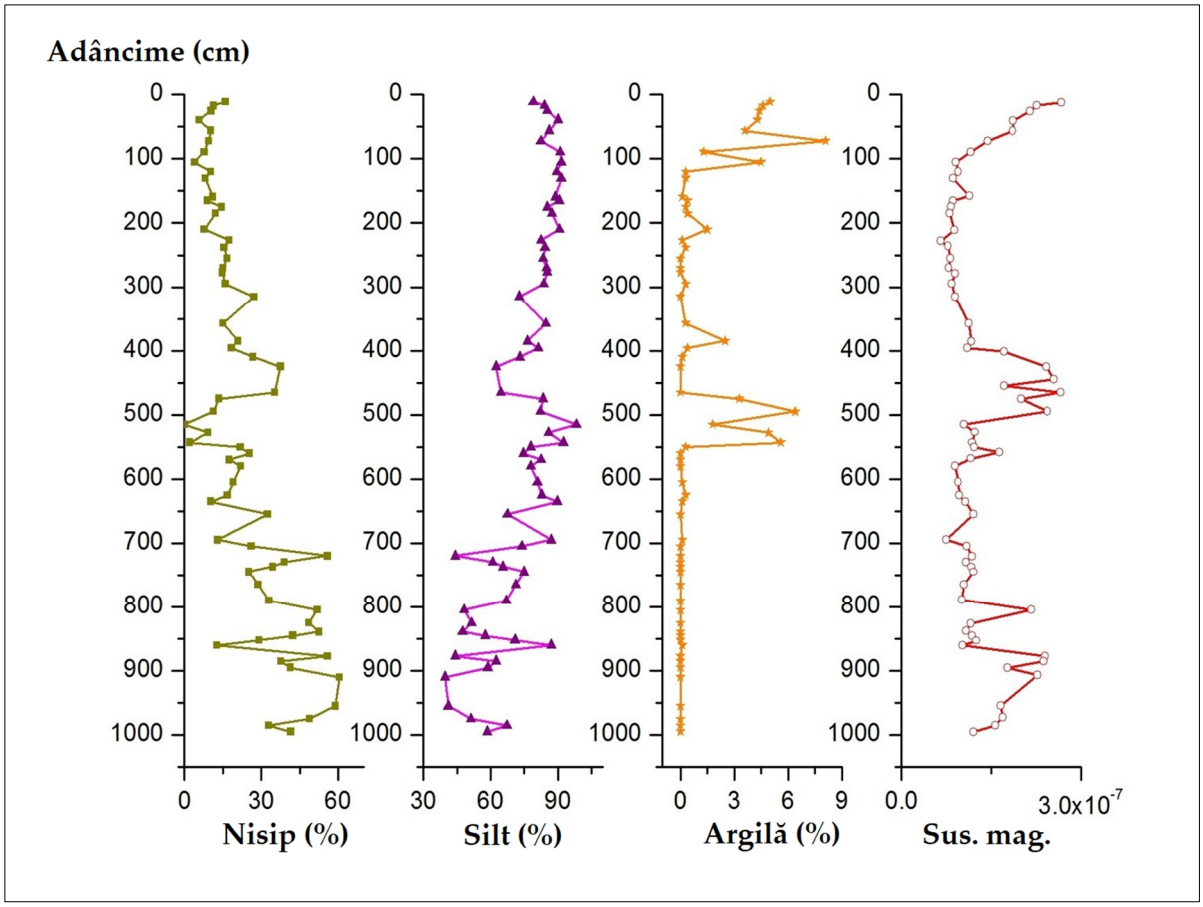

Fig. 8. Diagrame granulometrice și de susceptibilitate magnetică pentru carotajele sedimentologice C 3 și C 9.
Granulometric and magnetic susceptibility diagrams for the sedimentological corings C 3 and C 9.

- 554-690 cm, argilă siltică, bine sortată, cenușiu verzui deschis (5GY 7/1), omogenă, compactă, cu niveluri fine cu fragmente de cochilii, fără c. a.; nivel de acumulare aluvială.

- 690-770 cm, nisip fin, bine sortat, cenușiu verzui deschis-mediu (5GY 7/1, 6/1), cu intercalații argiloase, omogen, compact, cu rare cochilii și fragmente vegetale; nivel de acumulare aluvială.

- 770-787 cm, nivel de argilă bine sortată, organică, cenușiu verzui deschis (5GY 7/1), cu frecvente fragmente vegetale de dimensiuni mm-cm; nivel de acumulare bogat în materie organică.

- 787-1000 cm, nisip fin, bine sortat, microstratificat, cu intercalații de silt argilos și argilă siltică, cenușiu verzui deschis-mediu (5GY 7/1, 6/1), omogen, compact, cu rare fragmente de cochilii; nivel de acumulare aluvială.

Succesiunea sedimentară prezentată corespunde unor acumulări aluviale fine în cadrul câmpiei aluviale, într-o zonă depresionară, cu sedimentare predominant fină. Datările ^{14}C realizate pe probe de lemn au furnizat date sincrone locuirii eneolitice, pe intervalul de adâncime 710-930 cm. La acest nivel, analiza micromorfologică a unor probe din carotajul C 9 au permis identificarea unor niveluri fine de cenușă, acumulate *in situ*, atribuite unei zone de activitate în această zonă exterioară așezării. Interesant este și faptul că atât prezența constituenților antropici, cât și datele de susceptibilitate magnetică și de cronologie radiocarbon, marchează foarte bine cele două etape de locuire, din epoca fierului, respectiv din perioada eneolitică (fig. 8). Rezultatele datărilor radiocarbon menționate (tab. 1) se situează

în intervalele calibrate 2σ (probabilitate 95,4%) 4452-4267 cal BC, pe proba de lemn prelevată la adâncimea de 710 cm, respectiv 4495-4349 cal BC, pe o probă de lemn de la adâncimea de 930 cm. În această zonă nu a fost identificat nivelul de *loess* al martorului de terasă.

3. Carotajul efectuat pe latura de nord, notat cu C 6, este situat la cca 20 m de baza *Popinei* (fig. 7). Succesiunea stratigrafică observată în carotierul deschis, cu diametrul de 50 mm, poate fi sintetizată astfel:

- 0-11 cm, silt argilos, bine sortat, brun cenușiu închis (10YR 4/2), omogen, compact, cu structură agregată fină, cu frecvente fragmente vegetale, cu caracter organic; nivel organic al solului actual.
- 11-24 cm, silt argilos, bine sortat, brun cenușiu mediu (10YR 5/2), cu structură agregată, cu caracter organic, omogen, compact; nivel de sol actual.
- 24-109 cm, silt argilos, bine sortat, brun deschis (10YR 6/3), omogen, compact, cu impregnații feruginoase galben roșcate (7,5YR 6/8) și rare fragmente de cochilii, fără c. a.; nivel de acumulare aluvială.
- 109-133 cm, argilă siltică, bine sortată, brun deschis-mediu (10YR 6/3, 5/3), omogenă, compactă, fără c.a.; nivel de acumulare aluvială.
- 133-172 cm, silt argilos gălbui, ușor roșcat (7,5YR 7/6), omogen, compact, cu frecvente impreganții feruginoase, fără c. a.; nivel de acumulare aluvială.
- 172-357 cm, nisip fin, foarte bine sortat, cenușiu deschis (10YR 7/2), omogen, compact, cu impregnații feruginoase galben roșcate (7,5YR 6/8), fără c. a.; nivel de acumulare aluvială.
- 357-390, nisip mediu, bine sortat, gălbui (10YR 8/6), omogen, compact, cu impregnații feruginoase, fără c. a.; nivel de acumulare aluvială.
- 390-655, nisip siltic argilos, bine sortat, cenușiu verzui (5GY 6/1), omogen, compact, cu paiete fine de mica și impregnații organice brune (10YR 5/3) în partea inferioară; nivel de acumulare aluvială.
- 655-670 cm, argilă siltică fină, bine sortată, cenușiu verzui mediu (5GY 6/1), omogenă, compactă, fără c. a.; nivel de acumulare aluvială.
- 670-963 cm, nisip fin-mediu, bine sortat, cu intercalații de silt argilos și nisip grosier (grosimi de cca 10 cm), cenușiu verzui mediu (5GY 6/1), omogen, compact, cu rare impregnații brune (10YR 4/3) și rare fragmente vegetale și cochilii, fără c. a.; nivel de acumulare aluvială.
- 963-968 cm, argilă siltică, bine sortată, cenușiu verzui mediu (5GY 6/1), omogenă, compactă, fără c. a.; nivel de acumulare aluvială.
- 968-1000 cm, nisip mediu-grosier, bine sortat, cenușiu verzui deschis-mediu (5GY 7/1, 6/1), omogen, compact, cu rare impregnații organice brune (10YR 4/3); include în bază un fragment ceramic; nivel de acumulare aluvială.

Succesiunea sedimentară observată în acest carotaj este reprezentată exclusiv, ca și anterior, prin depuneri aluviale în zona de luncă internă, cu granulometrie fină în partea superioară și mai grosieră în partea inferioară, unde sunt prezente și niveluri de nisip mediu și nisip grosier. În baza carotajului, a fost identificat și un fragment ceramic remaniat, cu pastă de factură gumelnițeană (pastă fină, cu cioburi pisate și rare incluziuni vegetale, cu ardere oxidantă incompletă).

4. Pe latura de vest, la cca 10 m vest de baza *Popinei*, marcată de curba altimetrică de 10 m a fost realizat carotajul C 7 (fig. 7). Succesiunea stratigrafică observată în acest carotaj deschis, cu carotierul de 50 mm, poate fi prezentată astfel:

- 0-7 cm, silt argilos, bine sortat, brun cenușiu închis (10YR 4/2), omogen, moderat compact, cu structură agregată și caracter organic, cu frecvente rădăcini și fragmente vegetale; nivel organic al solului actual.

- 7-32 cm, silt argilos, bine sortat, brun cenușiu mediu-închis (10YR 5/2, 4/2), eterogen, moderat compact, cu structură agregată și caracter organic, cu frecvente rădăcini și fragmente vegetale, impregnații feruginoase brun roșcat (5YR 4/4) și rare cochilii; nivel de sol actual.

- 32-110 cm, silt argilos cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2) și brun gălbui (10 YR 5/6), ușor eterogen, moderat compact, fără c. a.; nivel de acumulare aluvială.

- 110-329 cm, nisip fin, bine sortat, gălbui (10 YR 7/6), omogen, compact, cu impregnații și concrețiuni feruginoase fine, fără c. a.; nivel de acumulare aluvială.

- 329-410 cm, nisip fin și silt argilos, bine sortat, cenușiu verzui deschis (5GY 7/1) și gălbui (10YR 7/8), relativ omogen, compact, cu impregnații feruginoase; nivel de acumulare aluvială.

- 410-618 cm, nisip fin-mediu, bine sortat, cenușiu verzui deschis (5GY 7/1), omogen, compact, cu mica fină și impregnații feruginoase, fără c. a.; nivel de acumulare aluvială.

- 618-645 cm, nisip fin-mediu, bine sortat, cenușiu verzui mediu (5GY 6/1), omogen, compact, cu frecvente cochilii mm și impregnații organice brune, fragmente vegetale (lemn), fără c. a.; nivel de acumulare aluvială.

- 645-725 cm, nisip fin, bine sortat, cenușiu verzui deschis (5GY 7/1), omogen, compact, cu micro-stratificație difuză, rare fragmente mm de scoici și un fragment ceramic; nivel de acumulare aluvială.

- 725-756, nisip fin, bine sortat, cenușiu verzui deschis (5GY 7/1), omogen, compact, cu fragmente de scoici și impregnații organice; nivel de acumulare aluvială.

- 756-800 cm, silt argilos cu nisip fin, bine sortat, cenușiu verzui deschis (5GY 7/1) și gălbui (10 YR 7/6), omogen, foarte compact; *loess* transformat pedogenetic.

- 800-834 cm, silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), foarte omogen, foarte compact, fără incluziuni; foarte probabil, orizont de paleosol și depozite de *loess* transformat pedogenetic.

- 834-900 cm, silt cu nisip fin-mediu, bine sortat, gălbui (10YR 7/6), foarte omogen, foarte compact, fără incluziuni; acumulare de tip *loess*.

Succesiunea sedimentară observată în acest carotaj este asemănătoare cu cea din carotajul C 2 realizat în zona sudică. Aceasta este alcătuită din acumulări fine, de natură aluvială, ce suprapun la adâncimea de 756 cm, depozitele de *loess* ale martorului de terasă. Un fragment ceramic a fost identificat la 715 cm adâncime.

Principalele rezultate obținute prin analiza acestor carotaje sedimentologice pot fi sumarizate astfel:

- Martorul de *loess* al terasei joase a fost identificat în zonele de sud și de vest, la adâncimi de 6,51 m, respectiv 7,56 m, cele două carotaje având cote altimetrice foarte apropiate;
- Succesiunea sedimentară este alcătuită predominant din depozite fine de acumulare aluvială reprezentate prin alternanțe de argilă-silt-nisip;
- Au fost identificate depozite foarte fine acumulate în cadrul unor zone cu sedimentare lacustră, indicate și prin și acumulări de cochilii fine sau frecvente vegetale;
- Zona de activitate antropică identificată în vecinătatea estică a așezării poate fi pusă în relație cu o structură de combustie.

Zona interioară

În această zonă, au fost realizate patru carotaje cu percuție mecanică.

1. Primul dintre acestea, notat cu C 19, este localizat în partea centrală a așezării, așa cum a fost aceasta determinată topografic (fig. 7), pe un interval de adâncime de 10 m. Coloana stratigrafică având diametrul de 50 mm a fost prelevată în succesiune continuă, tubată, în secțiuni de 1 m (fig. 9). Succesiunea sedimentară observată este descrisă în tabelul - anexă (tab. 2).

Principalele date stratigrafice rezultate din analiza unităților sedimentare pot fi sumarizate astfel:

- Martorul de *loess* al terasei a fost identificat la 975 cm adâncime;
- Au fost identificate nouă niveluri de locuințe, dintre care trei incendiate, dar și zone de deșeuri menajere și niveluri de locuire exterioară;
- În cadrul acestei succesiuni, nu a fost identificat niciun nivel ce ar putea fi atribuit unui posibil abandon, succesiunea eneolitică având continuitate de sedimentare;
- Începutul locuirii eneolitice în această zonă este încadrat cronologic în intervalul 4841-4619 cal BC (probabilitate 95,4%), pe baza analizei radiocarbon a unei probe de cărbune prelevată la adâncimea de 923 cm (tab. 1);
- Nivelul de la partea superioară a succesiunii corespunde perioadei de abandon post-eneolitic al zonei, până la începutul locuirii getice în acest sit. Nu au fost observate indicii sigure ale locuirii din epoca fierului în această zonă.

Fig. 9. Fotografia probelor tubate din carotajul sedimentologic C 19.
The photography of tubed samples from the sedimentological coring C 19.

2. Cel de al doilea carotaj cu percuție mecanică din interiorul sitului, notat cu C 20, a fost realizat cu un carotier de 50 mm deschis, fiind amplasat în vecinătatea nordică a drumului de acces pe popină, pe panta sudică a acesteia (fig. 7), până la adâncimea de 4 m.

Succesiunea sedimentară observată în această zonă, poate fi descrisă astfel:

- 0-35 cm, silt cu nisip fin-mediu, moderat sortat, brun cenușiu mediu (10YR 5/2), eterogen, moderat compact, cu structură agregată fină, cu rare granule fine de chirpici ars, oase și fragmente de rocă; sol actual format pe depozite de coluviu.

- 35-55 cm, silt cu nisip fin-mediu, moderat sortat, brun cenușiu mediu (10YR 5/2), omogen, moderat compact, granular, cu foarte rare granule cm de chirpici ars, un fragment ceramic de 1,5 cm; nivel de coluviu.

- 55-79 cm, silt cu nisip fin, moderat sortat, brun cenușiu mediu (10YR 5/2), ușor eterogen, moderat compact, cu structură agregată, cu rare granule mm de chirpici ars; orizont de sol (?) format pe depozite de coluviu.

- 79-116 cm, silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), omogen, compact, fin granular, fără c. a.; nivel de coluviu.

- 116-141 cm, silt cu nisip fin, bine sortat, cenușiu mediu (10YR 5/1) și brun gălbui deschis (10YR 6/4), cu aspect eterogen, moderat compact, cu granule fine de chirpici ars, cărbune, rare oase și fragmente ceramice; nivel de locuire (?).

- 141-179 cm, silt cu nisip fin, brun cenușiu deschis-mediu ((10YR 6/2, 5/2), omogen, moderat compact, fin granular, cu rare granule de cărbune fin și câteva fragmente cm de scoici; nivel de locuire.

- 179-190 cm, silt cu nisip fin, bine sortat, brun cenușiu mediu-închis (10YR 5/2, 4/2), omogen, moderat compact, cu c. a. mai frecvenți, un fragment ceramic de cca 2 cm; nivel de deșeuri menajere.

- 190-200 cm, silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, fără c. a; nivel de locuire.

- 200-220 cm, silt cu nisip fin, bine sortat, cenușiu mediu (10YR 5/1), ușor eterogen, moderat compact, cu rari c. a. (cărbune fin, fragmente de scoici, un fragment ceramic de 1 cm); nivel de locuire.

- 220-245 cm, silt cu nisip fin, bine sortat, brun mediu (10YR 4/3), omogen, compact, cu structură agregată, fără c. a.; orizont de paleosol (?).

- 245-300 cm, silt fin, foarte bine sortat, gălbui (10YR 7/6), foarte omogen, compact, cu porozitate fină, fără c. a; acumulare de l*oess* din alcătuirea martorului de terasă.

- 300-400 cm, *idem*; *Loess* din alcătuirea martorului de terasă.

3. Al treilea carotaj cu percuție din zona sitului, notat cu C 22, a fost realizat la marginea de sud a drumului, respectiv la limita nordică a ghețăriei din această zonă (fig. 7). Acesta este un carotaj realizat cu carotierul deschis, cu diametrul de 50 mm, până la adâncimea de 8 m. Lateral, la 1 m spre est, a fost realizat carotajul notat cu C 24, cu carotierul închis, cu prelevare cu coloană continuă, pe o adâncime de 7 m, în tuburi de 1 m. Succesiunea sedimentară observată în aceste două carotaje poate fi sintetizată astfel:

- 0-37 cm, silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), relativ omogen, moderat compact, cu structură agregată și frecvente rădăcini actuale; nivel de sol actual.

- 37-70 cm, silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), granular, omogen, compact, cu rare fragmente cm de cărămidă; nivel de sol, parțial cu acumulare de coluviu.

- 70-100 cm, silt cu nisip fin, bine sortat, brun deschis (10YR 6/3), omogen, compact, granular, fără c. a.; acumulare secundară (?).

- 100-175 cm, silt cu nisip fin, bine sortat, brun deschis (10YR 6/3), eterogen, moderat compact, cu structură granulară, cu rare granule mm de chirpici, carbonați, scoici și cărbune; include, în bază, un fragment ceramic de cca 2 cm; acumulare secundară (?).

- 175-226 cm, silt cu nisip fin, bine sortat, brun gălbui (10YR 5/8), granular, eterogen, moderat compact, cu rare granule de chirpici ars și lut gălbui; acumulare secundară.

- 226-285 cm, silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), eterogen, friabil, granular, cu cenușă și cărbune fin, oase de pești și fragmente de scoici; deșeuri menajere.

- 285-327 cm, silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), ușor eterogen, moderat compact, granular, cu rare fragmente de scoici și cărbune fin; nivel de locuire.

- 327-340 cm, silt cu nisip fin, bine sortat, cenușiu mediu (10YR 5/1), eterogen, friabil, fin granular, cu cenușă, cărbune și oase de pești; deșeuri menajere.

- 340-358 cm, silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), omogen, moderat compact, fin granular, cu rare oase de pești și cărbune; nivel de locuire.

- 358-400 cm, silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), eterogen, moderat compact, fin granular, cu cenușă, cărbune fin și oase de pești; deșeuri menajere.

- 400-431 cm, silt cu nisip fin, brun cenușiu deschis (10YR 6/2), ușor eterogen, moderat compact, cu structură granulară, cu frecvenți c. a. (cărbune fin, fragmente de cochilii 1-2 cm, un fragment ceramic de cca 4 cm); deșeuri menajere.

- 431-458 cm, silt cu nisip fin, brun gălbui (10YR 5/6), relativ omogen, moderat compact, cu rare fragmente de cochilii de scoici; nivel de locuire.

- 458-472 cm, silt cu nisip fin, gălbui (10YR 7/8), relativ omogen, moderat compact, cu foarte rari c. a. (oase și solzi de pești și fragmente de cochilii); nivel de locuire.

- 472-500 cm, silt cu nisip fin, gălbui (10YR 7/8), cu rare granule de cărbune fin, fragmente de cochilii și oase de pești; nivel de locuire.

- 500-570 cm, silt cu nisip fin, cu mica fină, bine sortat, gălbui (10YR 7/6), omogen, compact cu niveluri micro-stratificate, cu rari c. a. fini (cărbune fin, granule de chirpici ars, fragmente de cochilii 1-2 cm); depunere naturală, remaniere de c. a.

- 570-600 cm, silt fin, foarte bine sortat, brun gălbui (10YR 5/8), omogen, compact, fin granular, cu porozitate fină, cu foarte rari c. a.; depunere naturală, remaniere de c. a.

- 600-622 cm, silt fin, brun gălbui (10YR 5/8), omogen, compact, cu structură ușor laminară, cu foarte rari c. a. (cărbune fin și fragmente de cochilii), un fragment ceramic 2,5 cm de factură gumelnițeană; depunere naturală, remaniere de c. a., acumulare pe pantă.

- 622-645 cm, silt fin, foarte bine sortat, gălbui (10YR 7/6), omogen, compact, cu structură granulară fină, cu agregate mm de argilă cenușiu mediu și foarte rare granule mm de chirpici ars; partea superioară a depozitelor de *loess* din alcătuirea martorului de terasă.

- 645-800 cm, silt fin, foarte bine sortat, gălbui (10YR 7/6), foarte omogen, foarte compact, fin granular, fără c. a.; depozite de *loess* din martorul de terasă.

Această succesiune sedimentară, ca și datele obținute în carotajul prezentat anterior (C 20), indică faptul că în această zonă nu au fost identificate structuri de locuire *in situ*, ci doar niveluri de locuire exterioară, reprezentate îndeosebi prin deșeuri menajere. În baza succesiunii, nu a fost identificat orizontul de paleosol, acesta fiind, foarte probabil, îndepărtat prin intervențiile antropice. Nivelul de *loess* al martorului de terasă a fost identificat la adâncimea de 622 cm. Acumulările naturale cu remaniere de c. a., ce prezintă microstratificație fină, pot fi atribuite unui șanț de mari dimensiuni ce a fost realizat în această zonă. Acestea

sunt suprapuse de depozite de deșeuri acumulate pe panta *tell*-ului și de acumulări secundare determinate de intervențiile antropice începând cu sfârșitul secolului al XIX-lea, până astăzi.

Cod laborator	Carotaj/ sondaj	Adâncime/ context	Material	Data ^{14}C	Date cal BC (95,4%)
Poz-50350	C 9	710 cm	lemn	5510±40 BP	4452-4267
Poz-50348	C 3	930 cm	lemn	5570±40 BP	4488-4342
RoAMS 391.53	C 19	923 cm	cărbune	5874±38 BP	4841-4619
Poz-61120	C 24	527 cm	cărbune	5640±35 BP	4544-4369
Poz-51266	S I Est	US 30310	lemn	1975±30 BP	45 BC - 81 AD
Poz-58597	S I Est	US 30304	cărbune	5750±35 BP	4691-4501
Poz-66118	S II Vest	US 30507	cărbune	5880±40 BP	4846-4678
Poz-99770	S III Sud	US 30624	os	5610±50 BP	4538-4352
Poz-100070	S IV Nord	US 30710	cărbune	5745±35 BP	4690-4501

Tab. 1. Date radiocarbon din carotaje și sondaje sedimentologice.
Radiocarbon data from sedimentological corings and sondages.

Sondajele stratigrafice

Sondajul S I Est

Unul dintre obiectivele campaniei de cercetări arheologice din anul 2012 a fost realizarea unui sondaj stratigrafic pe latura de est a *tell*-ului, pentru obținerea unor date suplimentare privind amplitudinea stratigrafică a depunerilor arheologice în această zonă, în special a celor referitoare la începutul locuirii antropice pe *Popină*, studierea proceselor de distrugere/evoluție, cercetarea martorului de eroziune pe care este situată așezarea (Popovici *et alii* 2013, p. 22). Acest sondaj stratigrafic a avut și rolul stabilirii unei conexiuni stratigrafice cu nivelurile cercetate în suprafață (Popovici *et alii* 2014, p. 77).

Pe profilele sudic și nordic ale acestui sondaj au fost identificate locuințe incendiate și neincendiate, zone de deșeuri menajere și elementele de amenajare din baza *tell*-ului. De asemenea, a fost confirmat faptul că așezarea a fost amplasată pe un martor de eroziune din terasa joasă a Dunării, constituit din depozite de *loess*, grosimea nivelurilor arheologice fiind estimată la cca 8 m (Haită 2013, p. 242). Limita superioară a martorului de terasă a fost observată la adâncimea de 925 cm față de punctul de referință.

Realizarea acestui sondaj, cu dimensiunile de 26x2 m (fig. 11/A), a continuat în campania de cercetări arheologice din anul 2013, permițând astfel înregistrarea întregii succesiuni stratigrafice din această zonă[6].

Cercetarea arheologică a acestui sondaj a pus în evidență un număr de 14 locuințe, dintre care doar trei au fost incendiate (Popovici *et alii* 2014, p. 77-83). Principalele rezultate pot fi sintetizate astfel:

- Dintre cele 14 locuințe identificate, doar trei sunt incendiate, locuințele fiind organizate pe șapte niveluri stratigrafice;

[6]Rezultatele cercetărilor pluridisciplinare realizate în acest sondaj arheologic vor fi publicate, sperăm, într-un volum aparte. Înregistrarea stratigrafică a profilului magistral a fost realizată împreună cu regretatul profesor Dragomir-Nicolae Popovici și Mădălina Dimache (Muzeul Național de Istorie a României).

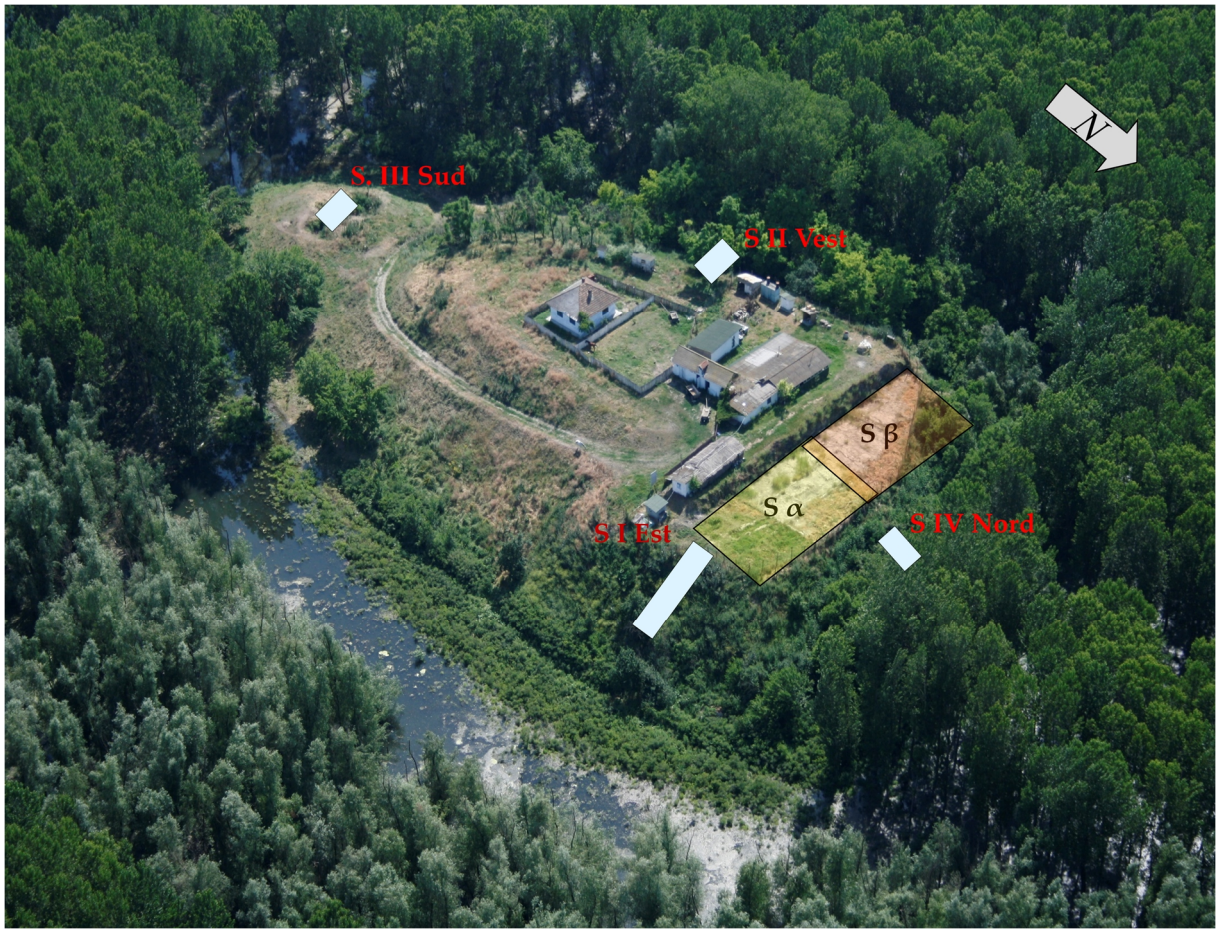

Fig. 10. Localizarea sondajelor stratigrafice realizate în situl Bordușani *Popină* pe o fotografie aeriană (https://peisaje-arheologice.ro/).
Location of the stratigraphic sondages achieved in the site Bordușani *Popină* on an aerial photograph (https://peisaje-arheologice.ro/).

- Nivelurile de deșeuri menajere și de locuire exterioară sunt intercalate nivelurilor de locuințe, alcătuind o succesiune cu continuitate stratigrafică;
- În baza sondajului, a fost identificată o amenajare de tipul unei terasări, probabil cu palisadă din epoca fierului;
- Cele două etape importante de locuire, pot fi atribuite cronologic intervalelor 4691-4501 cal BC (probabilitate 95,4%), respectiv 45 BC - 81 AD (probabilitate 95,4%), pentru momentele de început (tab. 1).

La partea superioară a succesiunii stratigrafice, a fost observat un nivel de coluviu care acoperă amenajarea realizată în perioada locuirii getice. Aceasta a fost observată pe latura de nord a *Popinei*, sub forma unei taluzări, încadrată stratigrafic perioadei anterioare realizării locuințelor, pe o adâncime de 2-2,50 m, perfect vertical, realizându-se o terasă cu lățime de 80-100 cm, racordată printr-o pantă lină, cu o lungime de 1,60-1,70 m, cu panta abruptă a popinei (Trohani 2005, pl. 4). În baza sondajului S I Est, pe profilul sudic, a fost observată o groapă de par (complex C 3015, US 30310) ce păstra lemn mineralizat (fig. 11/B). Datarea radiocarbon realizată pe acest lemn a oferit intervalul 45 BC - 81 AD (tab. 1), care corespunde perioadei atribuite locuirii din epoca La Tène.

A **B**

Fig. 11. Imagine de ansamblu a sondajului S I Est (A) și detaliu, în baza profilului sudic (B).
General view of sondage S I East (A) and detail on the base of the southern profile (B).

Sondajul S II Vest

În zona de vest a Popinei, la limita cu depozitele naturale ce constituie martorul de terasă, în campania de cercetări arheologice din anul 2014, a fost realizat un mic sondaj, cu dimensiunile de 2 x 1,5 m (fig. 12/A, B), în scopul înregistrării primelor niveluri de locuire eneolitică (Popovici *et alii* 2015, p. 39) în această zonă.

În baza profilului studiat a fost identificat orizontul de paleosol, ce suprapune depozitele de *loess* din alcătuirea martorului de terasă[7]. A fost identificată o groapă cu adâncimea de cca 1 m, ce poate corespunde unei amenajări de tipul unei palisade, realizată în primul moment al locuirii din această zonă. Aceasta este suprapusă în mod direct, la cota de 965 cm, de nivelurile de podele succesive ale unei locuințe care a fost distrusă prin incendiere. Datarea radiocarbon realizată pe o probă de cărbune prelevată în nivelul de amenajare din baza locuinței, a indicat intervalul 4846-4678 cal BC (tab. 1). Locuirea din Epoca fierului este absentă în această zonă, nivelul de abandon fiind suprapus de depuneri interpretate ca acumulări secundare, de tip coluviu, formate pe baza nivelurilor eneolitice, respectiv de orizontul de sol actual. Groapa de mici dimensiuni din partea superioară a succesiunii ar putea corespunde unei amenajări din perioada getică.

Sondajul S III Sud

În campania de cercetări arheologice din anul 2017, au fost realizate două sondaje stratigrafice: S III Sud și S IV Nord, cu scopul verificării stratigrafiei și recoltării unor probe pentru datare radiocarbon, ce puteau oferi date suplimentare privind locuirea antropică în aceste zone și încadrarea lor cronologică. Materialele arheologice descoperite au fost atribuite culturii Gumelnița și epocii La Tène, fără a fi identificate materiale ce ar fi putut aparține culturii Boian (Popovici *et alii* 2018, p. 20).

[7] Înregistrarea stratigrafică a profilelor sondajelor S II Vest, S III Sud și S IV Nord a fost realizată împreună cu regretatul profesor Dragomir-Nicolae Popovici.

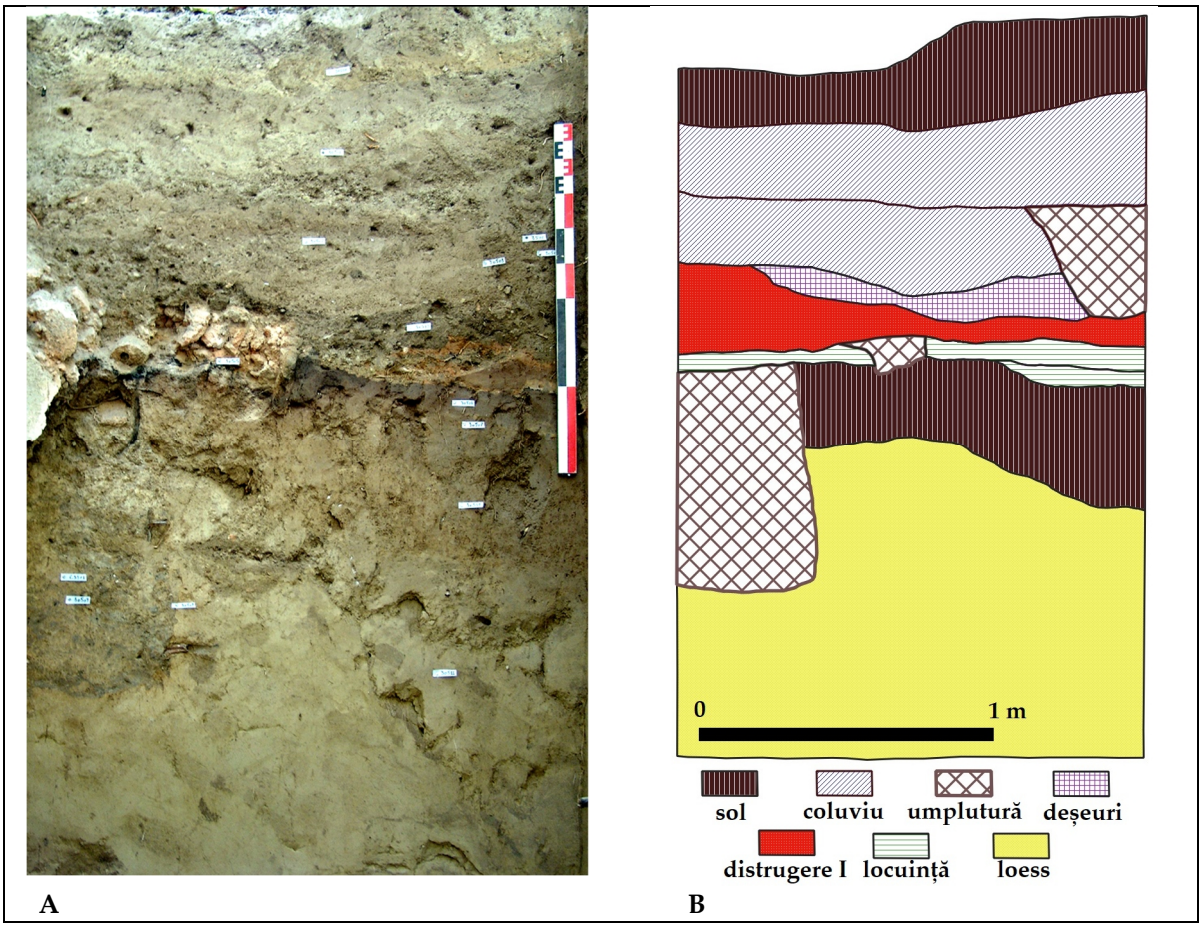

Fig. 12. Fotografie (A, scara 1 m) și desen (B) ale profilului estic al sondajului S II Vest.
Photo (A, scale bar 1 m) and drawing (B) of the eastern profile of the sondage S II Vest.

În zona de sud a Popinei, sondajul S III Sud a fost realizat pe latura sudică a gropii ghețăriei menționate anterior (fig. 13), cu dimensiunile 3,70 x 2,50 m.

Stratigrafia depunerilor antropice din această zonă a fost înregistrată atât pe profilul sudic, cât și pe cel vestic. În baza succesiunii sedimentare studiate, a fost observat nivelul de *loess*, suprapus de orizontul de paleosol (fig 13/B), la adâncimea de 970 cm față de punctul de referință. Acestea sunt tăiate de o groapă de tipul celei identificate în sondajul S II Vest.

Datele obținute pe profilul vestic indică, de asemenea, faptul că în această zonă era situată limita așezării eneolitice de tip *tell*. Aceasta era marcată de prezența unor structuri de delimitare, reprezentată prin cinci niveluri de șanțuri, însoțite, foarte probabil, de elemente de tipul palisadelor. De altfel, pe profil sudic al sondajului, penultimul nivel al acestora, notat cu C 3204, include și o groapă de par, observată pe 65 cm adâncime – C 3201. Aceste elemente au fost puse în evidență și detaliate prin sondajele de mai mare amploare realizate în campaniile din perioada 2021-2022 (Bem *et alii* 2021; 2022; 2023).

Datarea radiocarbon realizată pe o probă de os prelevată în nivelul de umplutură al primei gropi care taie paleosolul format pe depozitele de *loess* (US 30624) a indicat intervalul 4538-4352 cal BC (probabilitate 95,4%, tab. 1) pentru începutul locuirii eneolitice din această zonă.

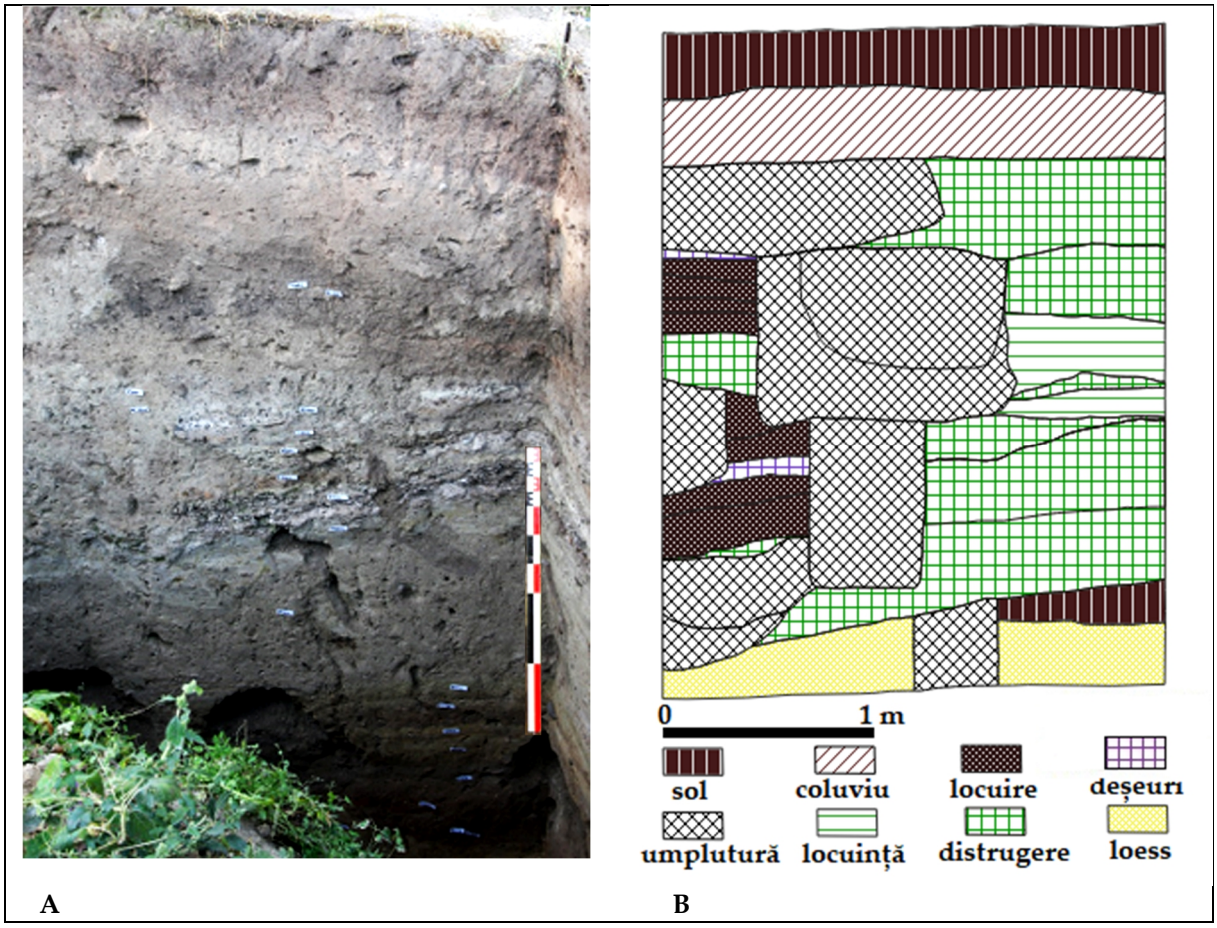

Fig. 13. Fotografie a profilului sudic (A, scara 1 m) și desen al profilului vestic (B) al sondajului S III Sud. Photo of the southern profile (A, scale bar 1 m) and drawing of the western profile (B) of the sondage S III Sud.

Sondajul S IV Nord

Primul sondaj realizat în zona nordică, cu aceleași baze metodologice ca și cel vestic, are dimensiunile de 2 x 1,5 m. Puternic perturbată de ganguri de animale, succesiunea sedimentară analizată pe profilul sudic al acestui sondaj nu a indicat, în mod cert, prezența orizontului de paleosol. Ca și în cele două situații prezentate anterior, succesiunea antropică începe cu o groapă de același tip, cu adâncime de cca 70 cm, ce taie nivelul de loess de la adâncimea de 845 cm față de punctul de referință. După acumularea unor niveluri de locuire exterioară, deși puternic deranjată de alunecările de pantă, este observată o locuință neincendiată, prima structură de locuire din această zonă. Aceasta este suprapusă de niveluri de acumulare de deșeuri menajere, materiale dintr-o distrugere fără incendiere, respectiv rezultate prin incendierea unor structuri construite.

Datarea radiocarbon a probei de cărbune prelevată în primul nivel de locuire care suprapune umplutura gropii de amenajare menționate, a indicat intervalul 4690-4501 cal BC (probabilitate 95,4%, tab. 1). Deși este evident faptul că partea nordică a *tell*-ului este parțial distrusă, cel puțin în partea ei superioară, atât de lucrările de amenajare din Epoca fierului, dar și de intervențiile contemporane, apreciem faptul că baza succesiunii studiate oferă indicii *in situ* asupra unora dintre primele momente de locuire eneolitică din această zonă.

Fig. 14. Fotografie (A, scara 1 m) și desen (B) al profilului sudic al sondajului S IV Nord.
Photo (A, scale bar 1 m) and drawing (B) of the southern profile of the sondage S IV Nord.

În campania de cercetări arheologice din anul 2018, alte două sondaje stratigrafice au fost realizate în zona nordică a Popinei: S V Nord, în zona de NNV, și S VI Nord-Est, în zona de NNE (Popovici *et alii* 2019, p. 26), în scopul obținerii unor date suplimentare asupra caracterului locuirii antropice din aceste zone, completând seria de sondaje S I - S IV, dispuse perimetral.

Sondajul S V Nord, cu dimensiunile de 10 x 1,5 m a fost săpat până la adâncimea de 989 cm relativ la punctul de cota zero m adâncime, situat la partea superioară a *Popinei*, fără să fie atinsă baza nivelului arheologic, observat pe o grosime de cca 4 m. Sondajul S VI Nord-Est a avut dimensiunile de 10 x 2 m, săpătura fiind realizată în trepte de cca 3 m, până la adâncimea maximă de 819 cm față de punctul altimetric cu cota 0 m, la adâncimea de 779 cm fiind observată limita nivelului arheologic cu solul natural (Popovici et *alii* 2019, p. 26). Analiza stratigrafică a profilelor sudice ale acestor două sondaje a furnizat, de asemenea, date suplimentare asupra sistemului de fortificare getic (Popovici *et alii*, 2019, p. 26-27).

◈ Concluzii

Așa cum am menționat, *tell*-ul Bordușani *Popină* a fost construit pe un martor de *loess* din terasa joasă a Dunării. Acesta a fost identificat în toate cele patru sondaje stratigrafice și în carotajele din interiorul sitului, dar și în două dintre carotajele realizate în zona de luncă, în imediata vecinătate a așezării.

Cotele limitei dintre paleosolul format pe *loess* și primele niveluri de locuire, corelate cu vârstele absolute, obținute prin datările radiocarbon, sugerează faptul că realizarea structurilor construite nu a fost inițiată pe toată suprafața *Popinei* în același timp, ca și în cazul așezării contemporane Hârșova *Tell*. În opinia lui Dragomir Popovici, așa cum a rezultat pe baza cercetărilor realizate pe întreg perimetrul sitului (Haită 2020), au existat, cel mai probabil, câteva nuclee de locuire care grupau primele locuințe, ulterior structurile construite fiind integrate în cadrul aceleași zone de locuire.

Identificată pe întreaga suprafață a *Popinei*, locuirea eneolitică este încadrată în exclusivitate în cultura Gumelnița (fazele A1 și A2). În nici unul dintre sondajele stratigrafice realizate perimetral nu a fost identificat inventar arheologic ce ar putea fi atribuit culturii Boian. De asemenea, în microzona Bordușani *Popină*, ce poate fi astăzi delimitată între digul din vecinătatea estică și brațul Borcea, nu sunt cunoscute alte zone de locuire neo-eneolitică.

În ceea ce privește dezvoltarea stratigrafică, ce atinge în carotajul C 19 cca 8,50 m, trebuie afirmat faptul că și aceasta prezintă unele diferențe, care pot fi interpretate ca fiind rezultatul concentrării locuirii, cel puțin în prima etapă, în zona nordică a *Popinei*. Toate succesiunile stratigrafice analizate indică faptul că nu există, cel puțin în această etapă a cercetării, indicii ale unor etape de abandon, locuirea observată fiind în perfectă continuitate stratigrafică. De altfel, pe baza analizei succesiunilor stratigrafice observate în sondajul S I Est și în carotajul C 19, nivelurile de locuințe sunt neuniform distribuite, iar zonele de locuire exterioară – corespunzătoare unor activități specifice, acumulării unor deșeuri sau unor amenajări din cadrul unor spații anexe – alternează cu zonele de construcție, amenajare și utilizare din cadrul locuințelor. De asemenea, secvențele stratigrafice nu au o structură asemănătoare în diferite zone din cadrul spațiului locuit. Distribuția locuințelor incendiate nu marchează niveluri distincte și continue, deseori acestea fiind învecinate cu locuințe neincendiate sau cu zone de deșeuri.

Analiza microstratigrafică a profilelor din sondajele stratigrafice a confirmat existența sistemului de terasare getic, în S I Est fiind identificată și o groapă de par dintr-o posibilă palisadă, datarea radiocarbon confirmând contemporaneitatea cu locuirea din cea de a doua etapă a Epocii fierului. Identificarea acestor structuri de amenajare și delimitare a confirmat și faptul că locuirea getică este localizată doar în jumătatea nordică a *Popinei*.

De asemenea, pentru locuirea eneolitică, există suficiente argumente stratigrafice privind existența unor structuri de delimitare, cu șanțuri/gropi și pari, ce corespund unor elemente de tipul palisadelor, la limita așezării, realizate în mai multe etape, încă din prima fază de locuire.

Informații semnificative au fost obținute și prin carotajele realizate în zona de luncă inundabilă, acestea conturând un cadru geomorfologic și sedimentologic complex, cu o sedimentare activă, atât în perioada eneolitică, cât și în Epoca fierului, marcând evoluții semnificative ale zonei de-a lungul ultimelor șase milenii.

◈ Mulțumiri

În cadrul acestui studiu au fost utilizate rezultate ale proiectului UEFISCDI - IDEI *Modele de co-evoluție între om și mediu în zona umedă a Bălții Ialomiței* (PN-II-ID-PCE-2011-3-0982).

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Tab. 2. Succesiunea stratigrafică observată în carotajul tubat C 19.
The stratigraphic succession observed in the tubed core C 19.

Adâncime (cm)	Descriere	Interpretare
0-15	Lacună de compactare.	
15-38	Silt cu nisip fin-mediu, moderat sortat, brun cenușiu închis (10YR 4/2), omogen, moderat compact, cu structură granulară fină, fisurație prismatică cm și rădăcini actuale, rare granule mm de chirpici ars și o așchie de os de 1,2 cm.	Sol actual.
38-55	Silt cu nisip fin, cu mica fină, bine sortat, brun cenușiu (10YR 5/2), mai omogen, compact, fin granular, cu rare granule mm de chirpici ars și cărbune.	Nivel de abandon.
55-78	Silt cu nisip fin, bine sortat, brun cenușiu, ușor eterogen, compact, cu rare granule de chirpici ars și fragmente de scoici cm.	Nivel de abandon.
78-100	Silt cu nisip fin-mediu, bine sortat, brun gălbui deschis (10YR 6/4), omogen, compact, cu foarte rari constituenți antropici (c. a.) fini.	Nivel de abandon.
100-109	Lacună de compactare	
109-115	Silt cu nisip fin, bine sortat, cenușiu închis-mediu (10YR 4/1, 5/1), cu limită gradată, ușor eterogen, compact, cu granule foarte fine de cărbune.	Nivel de incendiere *in situ*.
115-121	Silt cu nisip fin, bine sortat, cu mica fină, brun deschis și brun gălbui, omogen, compact, micro-stratificat, fără c. a.	Podele și lutuieli în locuință neincendiată
121-135	Silt cu nisip fin, bine sortat, cu mica fină, brun gălbui (10YR 5/4), omogen, moderat compact, cu structură granulară fină, fără c. a.	Nivel de podea în interiorul unei locuințe.
135-154	Silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), relativ omogen, compact, cu structură masivă.	Nivel de distrugere (?)
154-167	Silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), relativ omogen, moderat compact, cu structură granulară cu fragmente cm, cu rare fragmente de scoici de cca 1 cm.	Nivel de distrugere fără incendiere.
167-173	Silt cu nisip fin, bine sortat, brun gălbui (10YR 5/4) și brun cenușiu deschis (10YR 6/2), foarte omogen, compact, micro-stratificat, fără c. a. În partea inferioară, nivel cm cu amprente vegetale și impregnații feruginoase roșcat gălbui (5YR 6/6).	Nivel cu podele și lutuieli succesive în interiorul unei locuințe.
173-184	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, fără c. a.	Nivel de podea/ amenajare din locuință.
184-200	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, cu rare granule mm de cărbune, oase și carbonați.	Nivel de locuire exterior.
200-214	Lacună de compactare.	
214-226	Silt cu nisip fin, cu mica fină, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, cu impregnații feruginoase verzui și foarte rare scoici 1-2 cm.	Nivel de distrugere (?)
226-239	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), eterogen, moderat compact, granular, cu rare granule fine de cărbune, un fragment ceramic 2,5 cm.	Nivel de distrugere.
239-248	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), relativ omogen, compact, granular, cu rare oase de pești și granule de lut, un os de mamifer cca 3 cm.	Nivel de distrugere.
248-269	Silt cu nisip fin, bine sortat, cenușiu deschis (10YR 7/2), omogen, compact, micro-stratificat, cu foarte rare granule de cărbune și impregnații feruginoase verzui și galben roșcat.	Podele și lutuieli succesive în interiorul unei locuințe.

269-293	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, micro-stratificat, cu impregnații feruginoase verzui. Include (intervalul 175-181 cm) o lamină cu fragmente cm de lemn mineralizat, brun deschis, friabil.	Podele și lutuieli succesive. Include lemn dintr-o amenajare (groapă de par?).
293-300	Silt cu nisip fin, brun cenușiu deschis (10YR 6/2), ușor eterogen, moderat compact, fără c. a.	Nivel de podea sau amenajare.
300-313	Silt cu nisip fin, bine sortat, cenușiu deschis-mediu (10YR 7/1, 6/1), eterogen, compact, granular, cu fragmente de cărbune de 3-4 cm.	Nivel de distrugere.
313-325	Silt cu nisip fin, bine sortat, cenușiu deschis (10YR 7/2), eterogen, moderat compact, granular, cu c. a. fini (solzi și oase de pești, fragmente de cochilii, cărbune mm).	Nivel de distrugere.
325-333	Silt cu nisip fin, bine sortat, cenușiu deschis (10YR 7/2), omogen, compact, ușor micro-stratificat, cu impregnații feruginoase galben roșcat și verzui, fără c. a.	Podele și lutuieli succesive în interiorul unei locuințe.
333-339	Silt cu nisip fin, bine sortat, cenușiu mediu (10YR 5/1), relativ omogen, compact, fin stratificat, cu rari c. a. fini (cenușă, cărbune mm), un fragment ceramic cca 1 cm.	Nivel de locuire (în zonă amenajată?).
339-340	Lamină de cenușă fină, cenușiu deschis (10YR 7/2), omogenă, friabilă, fin granulară, cu cărbune fin.	Nivel de locuire.
340-350	Silt cu nisip fin, bine sortat, brun mediu (10YR 4/3), relativ omogen, compact, granular, cu granule sub-cm de chirpici ars.	Nivel de locuire.
350-351	Lentilă brun cărămiziu (5YR 5/4), omogenă, compactă, fin granulară, cu fragmente sub-cm de chirpici ars și cărbune.	Nivel de locuire.
351-372	Silt și nisip fin, bine sortat, brun gălbui (10YR 5/6) și brun cenușiu mediu (10YR 5/2), omogen, compact, micro-stratificat, cu foarte rari c. a. fini (cărbune și cenușă).	Podele și lutuieli în interiorul unei locuințe.
372-389	Silt și nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, cu structură granulară, cu lamine de lut și fragmente de lemn și cărbune și zone cu frecvente granule carbonatice.	Nivel de distrugere fără incendiere.
389-400	Silt și nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, cu structură granulară, cu granule de lut, cărbune fin și rari carbonați.	Nivel de distrugere fără incendiere.
400-415	Silt și nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, cu structură granulară, cu cărbune și cenușă și impregnații feruginoase verzui.	Nivel de distrugere fără incendiere.
415-454	Silt și nisip fin, foarte bine sortat, brun cenușiu deschis și mediu (10YR 6/2, 5/2), brun gălbui (10YR 5/6) și galben verzui (2,5 Y 6/8), foarte omogen, compact, micro-stratificat, cu foarte rari c. a. fini și lentile mm cu carbonați fini.	Podele și lutuieli în interiorul unei locuințe.
454-464	Silt cu nisip fin, bine sortat, brun cărămiziu mediu (5YR 5/4), omogen, compact, granular, cu chirpici ars și cărbune.	Nivel de distrugere prin incendiere.
464-481	Silt cu nisip fin, bine sortat, brun cenușiu mediu-închis (10YR 5/2, 4/2), omogen, compact, granular, cu chirpici ars și cărbune.	Nivel de incendiere *in situ*.
481-500	Silt cu nisip fin, bine sortat, brun cărămiziu deschis (5YR 6/4), foarte omogen, compact, fin granular, fără c. a.	Nivel de incendiere *in situ*.
500-505	Lacună de compactare.	

505-528	Silt cu nisip fin-mediu, bine sortat, brun cenușiu deschis (10YR 6/2) și brun cărămiziu mediu (5YR 5/4), eterogen, compact, granular, cu frecvent chirpici ars și cărbune.	Nivel de distrugere prin incendiere.
528-531	Nivel de cenușă, cenușiu deschis (10YR 7/1), omogen, friabil, fin granular, cu cărbune fin.	Nivel de incendiere *in situ*.
531-535	Silt cu nisip fin, bine sortat, brun cărămiziu mediu-închis (5YR 4/4, 3/4), omogen, compact, cu cărbune fin.	Nivel de podea incendiată.
535-550	Silt cu nisip fin, brun cenușiu mediu-închis (10YR 5/2, 4/2), foarte omogen, compact, fin granular, fără c. a.	Podele și lutuieli succesive în locuință.
550-563	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, micro-stratificat, cu frecvente granule carbonatice și fragmente sub-cm de cochilii.	Podele și lutuieli succesive în locuință.
563-571	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, micro-stratificat, cu granule fine de cenușă și cărbune.	Podele și lutuieli succesive în locuință.
571-579	Silt cu nisip fin, moderat sortat, brun cenușiu mediu-închis (10YR 5/2, 4/2), eterogen, compact, micro-stratificat cu granule de cărbune, scoici mm-cm și lentile cu cărbune.	Nivel de locuire exterior, deșeuri menajere.
579-586	Silt cu nisip fin, moderat sortat, brun cenușiu mediu-închis (10YR 5/2, 4/2), eterogen, compact, micro-stratificat, cu frecvente granule de cenușă și cărbune.	Nivel de locuire exterior, deșeuri menajere.
586-600	Silt cu nisip fin, bine sortat, galben verzui, omogen, compact, granular, fără c. a.	Nivel de distrugere fără incendiere.
600-612	Silt cu nisip fin, bine sortat, brun gălbui (10YR 5/4), omogen, compact, micro-stratificat, fără c. a.	Podele și lutuieli în interiorul locuinței.
612-618	Silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), omogen, compact, micro-stratificat, fără c. a.	Podele și lutuieli în interiorul locuinței.
618-633	Silt cu nisip fin, bine sortat, brun cărămiziu deschis-mediu (5YR 6/4, 5/4), omogen, compact, granular, cu fragmente cm de chirpici ars.	Nivel de distrugere prin incendiere.
633-638	Silt cu nisip fin, bine sortat, cenușiu mediu (10YR 6/1), omogen, compact, fin granular, cu frecvent cărbune fin.	Nivel de distrugere prin incendiere (*in situ*?).
638-647	Silt cu nisip fin, bine sortat, brun cărămiziu deschis (5YR 6/4), omogen, compact, fin granular, cu frecvent cărbune fin.	Nivel de distrugere prin incendiere (*in situ*?).
647-650	Silt cu nisip fin, bine sortat, brun cărămiziu mediu-închis (5YR 4/4, 3/4), omogen, compact, fără c. a.	Nivel de podea incendiată *in situ*.
650-658	Lamină cu cenușă și cărbune fin și lut gălbui (10 YR 7/2) și cenușiu deschis (10YR 7/1), omogen, compact, micro-stratificat.	Lutuieli și niveluri ocupaționale în locuință.
658-685	Silt cu nisip fin, bine sortat, brun gălbui (10YR 5/4), foarte omogen, compact, micro-stratificat, fără c. a.	Podele și lutuieli în interiorul unei locuințe.
685-712	Silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, granular, cu frecvente oase de pești, granule de cărbune, chirpici ars, os de mamifer de cca 3 cm.	Nivel de locuire exterior, deșeuri menajere.
712-725	Silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, fin stratificat, cu caracter organic, cu frecvenți c. a. (oase de pești, cărbune, chirpici ars, cochilii).	Nivel de locuire exterior, deșeuri menajere.

725-744	Silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, granular, cu frecvenți c. a. (oase de pești, cărbune, chirpici ars, granule carbonatice și cochilii).	Nivel de locuire exterior, deșeuri menajere.
744-759	Silt cu nisip fin, bine sortat, brun gălbui (10YR 5/6), eterogen, compact, granular, cu frecvente fragmente cm de lut și granule de cărbune fin.	Nivel de locuire exterior, deșeuri menajere.
759-783	Silt cu nisip fin, bine sortat, brun cenușiu mediu (10YR 5/2), eterogen, compact, granular, cu frecvente granule de cărbune, fragmente de cochilii și constituenți organici 1-2 cm.	Nivel de locuire exterior, deșeuri menajere.
783-800	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), eterogen, compact, granular, cu frecvente fragmente de scoici, oase de pești, granule de cărbune și rare lentile de lut.	Nivel de locuire exterior, deșeuri menajere.
800-810	Lacună de compactare.	
810-819	Silt cu nisip fin, bine sortat, brun cenușiu deschis (10YR 6/2), omogen, compact, granular, cu granule de cărbune fin.	Nivel de distrugere.
819-836	Silt cu nisip fin, bine sortat, cenușiu mediu (10YR 5/1), omogen, compact, granular, cu cărbune și lut ars.	Nivel de distrugere.
836-844	Silt cu nisip fin, bine sortat, brun cărămiziu mediu (5YR 4/4) și cenușiu mediu-închis (10YR 5/1, 4/1), eterogen, foarte compact, cu fragmente de chirpici ars.	Nivel de distrugere / nivelare.
844-869	Silt cu nisip fin, brun cenușiu mediu (10YR 5/2), eterogen, compact, fin stratificat, cu frecvenți c. a. (oase de pești, cochilii, cărbune fin, granule de lut ars).	Nivel de locuire exterior, deșeuri menajere.
869-885	Silt cu nisip fin, brun cenușiu mediu (10YR 5/2), eterogen, compact, granular, cu frecvenți c. a (oase de pești, scoici, cărbune fin).	Nivel de locuire exterior, deșeuri menajere.
885-900	Silt cu nisip fin, brun mediu (10YR 4/2), eterogen, compact, granular, cu caracter organic și frecvenți c. a (oase de pești, scoici).	Nivel de locuire exterior, deșeuri menajere.
900-908	Silt cu nisip fin, brun cenușiu mediu (10YR 5/2), eterogen, compact, granular, cu caracter organic și frecvenți c. a (oase de pești, cărbune, chirpici ars).	Nivel de locuire exterior. Acumulare de deșeuri menajere.
908-925	Silt cu nisip fin, brun cenușiu mediu (10YR 5/2), eterogen, compact, fin stratificat, cu frecvenți c. a. (cochilii, oase de pești, cărbune fin).	Nivel de locuire exterior, deșeuri menajere.
925-927	Silt cu nisip fin, bine sortat, cenușiu închis (10YR 4/1), omogen, compact, granular, cu frecvent cărbune și lut ars.	Nivel de deșeuri menajere.
927-949	Silt cu nisip fin, brun cenușiu mediu (10YR 5/2), eterogen, compact, fin stratificat, cu frecvenți c. a. (cochilii, oase de pești, cărbune fin).	Nivel de locuire exterior, deșeuri menajere.
949-966	Silt cu nisip fin, brun cenușiu mediu (10YR 5/2), eterogen, compact, fin stratificat, cu frecvenți c. a. (cochilii, cărbune fin cenușă) și lentile siltice gălbui.	Nivel de locuire exterior, deșeuri menajere.
966-981	Silt cu nisip fin, brun gălbui (10YR 5/4), relativ omogen, compact, micro-stratificat, cu lamine cu cărbune și cenușă.	Nivel de amenajare (?).
981-1000	Silt fin, foarte bine sortat, gălbui (10YR 7/6), foarte omogen, foarte compact, fără c. a.	Acumulare de *loess* din martorul de terasă.

South Caucasian Chalcolithic pottery as seen from the cave Getahovit-2, north-eastern Armenia

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Abstract: *The Chalcolithic cultures of the South Caucasian region continue to pose challenges that necessitate further refinement and supplementary data. Among the limited number of well-stratified sites from this period, the Getahovit-2 cave in Armenia stands out for its evidence of prolonged occupation. The site's uninterrupted sequence of habitation, along with its rare documentation of transitions between periods, offers significant contributions to ongoing research.*

The pottery assemblages discovered in securely dated Chalcolithic contexts at Getahovit-2 are invaluable for reassessing existing hypotheses and exploring foundational questions about the era. These assemblages were analysed through a combination of quantitative and qualitative approaches, with particular attention given to clay consistency and other material properties. Additionally, the study delves into the specific attributes of pottery associated with each stratigraphic horizon identified at the site.

Notably, the stratigraphy of the Getahovit-2 cave reveals that it served as a regular destination for groups from neighbouring settlements. This pattern of use indicates the presence of communities with variant pottery traditions. Such variation may reflect broader socio-economic transformations occurring during the Chalcolithic period.

Rezumat: *Culturile eneolitice din regiunea Caucazului de Sud continuă să ofere noi provocări care necesită o abordare mai complexă și date suplimentare. Dintre numărul limitat de situri stratificate din această perioadă, peștera Getahovit-2 din Armenia se remarcă prin perioada lungă de ocupare. Secvența neîntreruptă de locuire a sitului, dar și documentarea perioadelor de tranziție, conferă perspective importante cercetărilor în curs.*

Colecțiile de vase ceramice descoperite în contexte eneolitice de la Getahovit-2 și confirmate de datări sunt importante pentru reevaluarea ipotezelor existente și explorarea întrebărilor fundamentale pentru această perioadă. Aceste ansambluri au fost analizate printr-o combinație de abordări cantitative și calitative, acordând o atenție deosebită pastei ceramice și caracteristicilor acesteia. În plus, studiul analizează atributele specifice ale ceramicii asociate fiecărui orizont stratigrafic identificat în sit.

În particular, dacă ne referim la stratigrafia peșterii Getahovit-2 se observă că aceasta a fost utilizată de grupurile umane din așezările învecinate. Acest model de ocupare ne indică prezența comunităților cu tipuri diferite de ceramică. O astfel de varietate poate reflecta transformări socio-economice mai ample care ar fi putut avea loc în perioada eneolitică.

Keywords: *Armenia, Getahovit-2 Cave, Chalcolithic, Grit ware, Chaff tempered ware, Sioni tradition*

Cuvinte-cheie: *Armenia, Peștera Getahovit-2, calcolitic, ceramică cu pietricele, pastă cu pleavă, tradiție Sioni*

◈ Introduction

The prehistory of the South Caucasus, despite extensive and meticulous research, continues to require further clarification and leaves many questions unanswered. The Chalcolithic period in particular poses significant challenges. Several key issues remain

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unresolved, with pottery traditions – one of the fundamental attributes of these cultures – standing out as a notable aspect.

This article examines the pottery types unearthed over more than a decade of archaeological excavations at the Getahovit-2 cave, from layers attributed to the Chalcolithic period. The ceramic assemblages have been classified based on dated horizons and grouped according to temper types. New data are presented, accompanied by a discussion that aims to provide interpretations grounded in excavation evidence.

The stratigraphic precision, combined with a series of radiocarbon dates, has enabled the identification of distinct horizons corresponding to the phases of the Early to Middle Chalcolithic period (Gasparyan, Arimura 2014, p. 32, tab. 1). The most active horizons were associated with the late phases of Chalcolithic layers, which likely reflect a prolonged period of habitation in the cave. These layers yielded features such as pits, fireplaces, and simple masonry structures.

Findings such as bone tools (Zarikian, Kalantaryan 2021, p. 77-84), obsidian artefacts, occasional flint items, and especially a substantial number of ceramic sherds further support this interpretation. Separated from the later occupation layers by muddy deposits, one particular Chalcolithic horizon revealed relatively early dates, and the pottery found within it differed from previously identified types (Kalantaryan, Ghanem 2019, p. 12-14).

The transition from the Late Neolithic suggests activity within the cave, though no pottery has been found. A similar situation is observed in the Late Neolithic horizons, where clear traces of occupation exist despite the absence of ceramics. It is likely that these visits during the Neolithic were very brief and possibly even accidental (Kalantaryan *et alii* 2021, p. 72-74).

◈ The Chalcolithic period in the regional context

The cultural phenomenon called Chalcolithic still enables scholars to propose new hypotheses about its origins or concepts (Bakhshaliev *et alii* 2024b; Lyonnet 2022; Marro 2022, p. 116-118). In the South Caucasus, this period spans from approximately the end of the 6th millennium BC to the emergence of the Kura-Araxes culture, a significant new cultural phenomenon in the region (EB Age 3500/3400-2300 BC).

Generally, the period by itself can be divided into two main phases: early and late. Despite this, sometimes other concepts can also separate the middle phase of the period.

Based on the data, the early phase can be pointed between 5200/5000 BC and 4500/4300 BC, the middle should fit into the 4500/4300-4000 BC, and the late segment will cover the first half of the 4th millennium BC (Lyonnet 2007; Kiguradze 2000; Kiguradze, Sagona 2004, p. 40; Sagona 2018, p. 133). The key sites can present the typical attributes such as the Mentesh Tepe (Lyonnet *et alii* 2012, p. 87; Lyonnet *et alii* 2016, p. 170; Lyonnet *et alii* 2017) or Ovçular Tepesi (Marro *et alii* 2009; 2011) for the early phase and the Leila Culture (Museibli 2015, p. 58; Museibli 2016, p. 15; Museyibli 2016, p. 284, Narimanov *et alii* 2007) or Godedzor (Chataigner *et alii* 2010, p. 391; Palumbi *et alii* 2021; Avetisyan 2022, p. 52-66) for the late. Based on data from Tepe Gawra and comparative evidence from Mesopotamian sites, M. Rothman developed a scheme that he described as "purely chronological", identifying five phases for the Late Chalcolithic (Rothman 2002, tab. I–II). He utilized available absolute dating methods, including radiocarbon analysis, to establish these divisions, while also incorporating stylistic comparisons of artifacts (Rothman 2002, p. 51). Except for these chronological divisions, the cultural traditional divisions also existed. This concept contains the ceramic clusters called Chaff-faced and Sioni ware (Sagona 2018, p. 182-212).

◈ Cultural traditions of Chalcolithic

There is no need to revisit the well-established discussions on Chalcolithic cultures and their development. However, it is worth briefly noting the existence of two generally accepted traditions. The Sioni culture, named after its eponymous site, encompasses several related settlements that share defining characteristics, with ceramic complex playing a central role. The pottery exhibits continuity with the Shomu-Shulaveri culture while also introducing new shapes (Lyonnet 2018b, p. 131). There is no clear definition of this culture or cultural complex as some scholars prefer to name (Lyonnet 2018a, p. 549).

The term **"Sioni Culture"** was coined by T. Kiguradze**,** one of the archaeologists who excavated the small site bearing the same eponymous in Georgia. He distinguished this cultural phase as a distinct chronological period, separating its later developments from the Shulaveri cultural phenomenon (ca. 6000-5200 cal BC), which was characteristic of the central part of the South Caucasus.

In his earlier articles, T. Kiguradze (Kiguradze, Menadbe 2004) argued that the Sioni Culture originated from the Shulaveri cultural group. However, they also emphasized its distinct characteristics, highlighting absolute differences between the two traditions. Debates surrounding the chronology of the Sioni site placed it within the late phases of the Chalcolithic period. Furthermore, the authors suggested that the **Sioni cultural phenomenon** played a significant role in the formation of the Kura-Araxes Culture (Kiguradze 2000). The Sioni culture is more primarily characterized by its ceramic assemblage with mineral temper, though other attributes also played a significant role in its definition. The site of Sioni itself dates to the end of the 5th millennium BC, yet it has lent its name to a broader cultural tradition (Lyonnet 2018a).

The Chaff-Faced Ware tradition reflects a uniform ceramic practice marked by streamlined manufacturing methods and a cohesive technological framework. While vessel shapes and decorative details exhibit regional diversity, the core characteristics of this tradition remain strikingly consistent throughout its range. The most distinctive characteristic is the extensive use of organic temper, as potters incorporated chaff into the clay mixture (Sagona 2018, p. 184-185).

The settlement of Godedzor, located at a high altitude (1800 m a.s.l.) in the Vorotan Valley of southern Armenia, stands out among Armenian sites. The earlier two occupation levels revealed curved stone-wall structures, chaff-tempered ceramics, hearth stands, bone tools, and remarkable painted sherds. Radiocarbon dating places its occupation in the mid-to-late fourth millennium BC, marking it as a late example of the Chaff-Faced Ware horizon. Similar ceramic variants have been identified in north-west Iran, particularly at Pisdeli Tepe and Tappah Giljar C (Chataigner *et alii* 2010; Palumbi *et alii* 2021).

Dozens of scientific works dedicated to this issues (Kiguradze 2000; Kiguradze, Sagona 2004; Sagona 2014; 2018; Lyonnet, Guliev 2017; Lyonnet 2018a and 2018b; Marro *et alii* 2009, 2011 and 2019), but still with the accumulation of data on the Chalcolithic period, scientific approaches have undergone transformation, leading to new interpretations and prompting scholars to revise or reconsider earlier theories (Sagona 2014; Lyonnet 2018a).

◈ Studies of the "Sioni" culture in Armenia

The Armenian studies of the culture added important data to the excavation series at the neighbouring territories of Georgia and Azerbaijan. During the same period—parallel with

the investigations of sites associated with the Aratashen–Shulaveri–Shomutepe cultural horizon, such as Aknashen-Khatunarkh (Badalyan, Harutyunyan 2022), Adablur (Areshian 1991), the lower layers of Shengavit (Sardaryan 1967, p. 161–181), and Tsaghkunq (excavated by R. Torosyan in the 1960s)—the important site of Teghut was uncovered in the Ararat Plain. Among these, Teghut currently stands out as the only site that can be characterized as a permanent and relatively well-preserved settlement of the Chalcolithic period (Torosyan 1976, p. 23).

The new wave of investigations rose in the first decade of the 21st century, when interest in the region's prehistory was activated. A series of the sites of the period started to be studied with the help of the active involvement of international teams. The most remarkable ones are the studies of Mushakan-4 settlement in the Ararat Depression, which should be placed in the middle piece of the period; the caves 1 and 2 of Yenokavan; Hovk 1and Hovk 3 rock shelters located in the northern parts of Armenia; the Barepat-1, a small mountainous site situated on the left side of the Barepat River, north of Lake Sevan; and the rock shelter of Tsaghkahovit-1 (Mt. Aragats) (Arimura *et alii* 2012, p. 138-139) that must cover the middle phase of Chalcolithic (Arimura *et alii* 2014, p. 261-266; Gasparyan, Arimura 2014, p. 18-20; Pinhasi *et alii* 2011). The late stage of the discussed period is presented with the Areni-1 cave in the Arpa River Valley (dated between 4300-3400 cal BC) (Areshian *et alii* 2012; Wilkinson *et alii* 2012) and the Nerkin Godedzor settlement (Chataigner *et alii* 2010; Palumbi *et alii* 2021), located to the south. The radiocarbon dates from the site covered the range of the late Chalcolithic period of Armenia (3700-3400 cal BC). All of these archaeological sites provided unprecedented data compared to what was previously available. This entire list can be classified as atypical sites, characterized by attributes such as seasonal or trade-oriented functions.

Regional studies of the period have indeed provided new data that contribute to a broader understanding of the overall context. In reality, the problem of mobility of the Chalcolithic population and the occupation and exploitation of the multivarious environmental niches are proved by these investigations. For instance, the risqué excavations at the highly elevated (nearly 1800 m a.s.l.) Mastara-1 settlement, located on the slopes of Mt. Aragats, demonstrate preliminary dates in the Neolithic period covered by the occupation remnants of the Chalcolithic (Gasparyan, Arimura 2014, p. 18-20). The excavations of two burial kurgans of Aknalitch provided new data (Muradyan *et alii* 2014, p. 339-364). During the last two years investigations have been carried out in the rock shelter Yeghegis (Vayots Dzor, Armenia), where the pottery of both types – Sioni and Chaff ware uncovered. The ^{14}C dates pointed the LC phase of the period (Antonosyan *et alii* 2024, p. 2; Frahm *et alii* 2024, p. 3-4).

Among this list, the Getahovit-2 cave has a special position as the data from the site fits well with all the discussed phases of the period. The investigations of the Getahovit-2 cave are very productive because of constant excavations and the existence of the horizons that had been occupied during the long period of the Chalcolithic, especially the whole 5th millennium presented. Well-stratified layers have dates and assemblages of materials, and first of all pottery, which is the most impressive marker of cultural attribution.

◈The Getahovit-2 cave

Geographical location and research history

The site is located not far from the Ijevan (Tavush, north-eastern Armenia), between the modern villages of Yenokavan and Getahovit (N 40°54′38.5″, E 045°05′59.7″, ca. 960 m altitude). It is one of the cave groups situated on the bank of the very attractive forested canyon

of the Khachaghbyur River. It is placed on the left terrace, in the vicinity of a larger cave named Getahovit-1 (fig. 1-2).

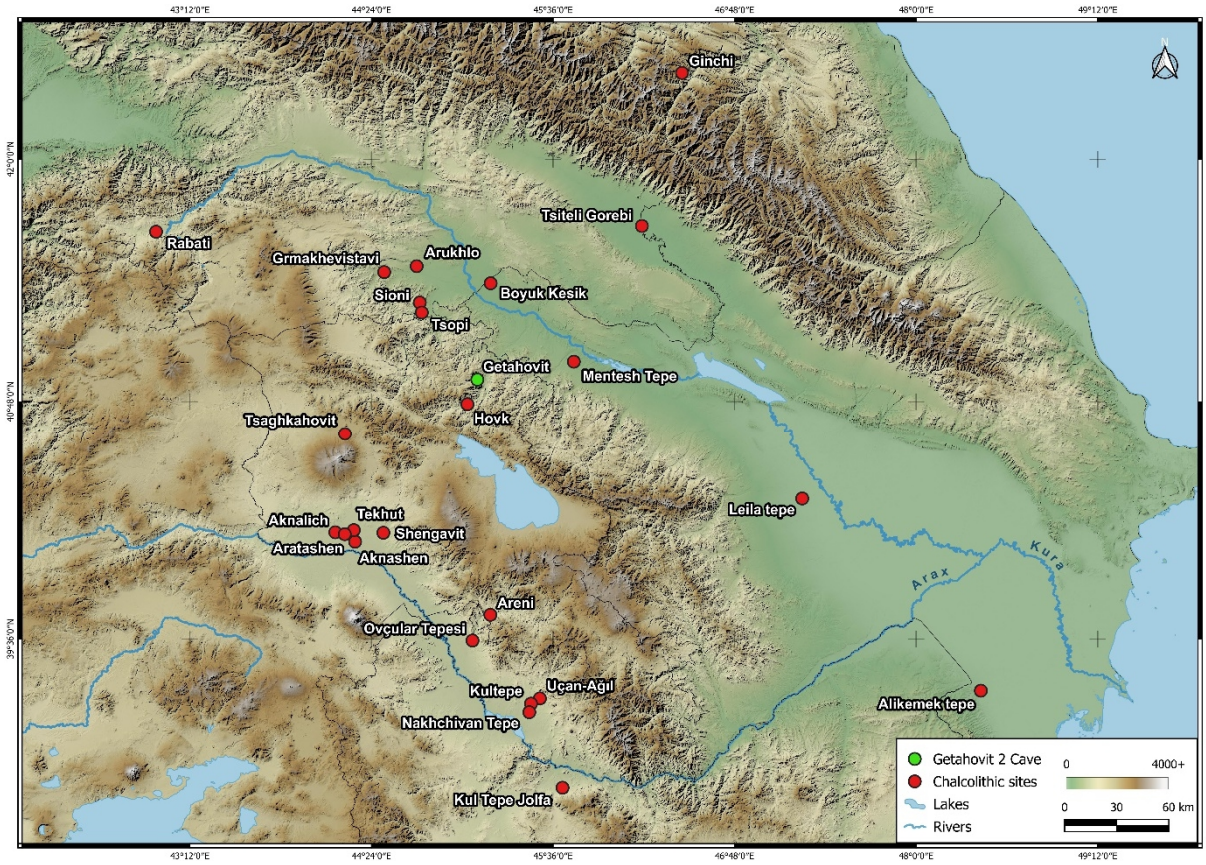


Fig. 1. Map of principal sites related to the cultural connections of the Getahovit-2 cave inhabitants (designed by A. Ananyan).
Harta principalelor situri cu conexiuni culturale ale locuirilor din peșteră Getahovit-2 (realizat de A. Ananyan).

Fig. 2. The forested canyon of the Khachaghbyur River (photo from the Getahovit expedition archives).
Canionul împădurit al râului Khachaghbyur (fotografie din arhivele expediției Getahovit).

Both caves were documented in 2010 during a survey conducted to identify and record prehistoric occupation traces in northern Armenia. This issue remained poorly investigated in the region. To advance research, a collaborative project was established between the Institute of Archaeology and Ethnography of NAS RA and the French archaeological mission "Caucasus", led by Christine Chataigner.

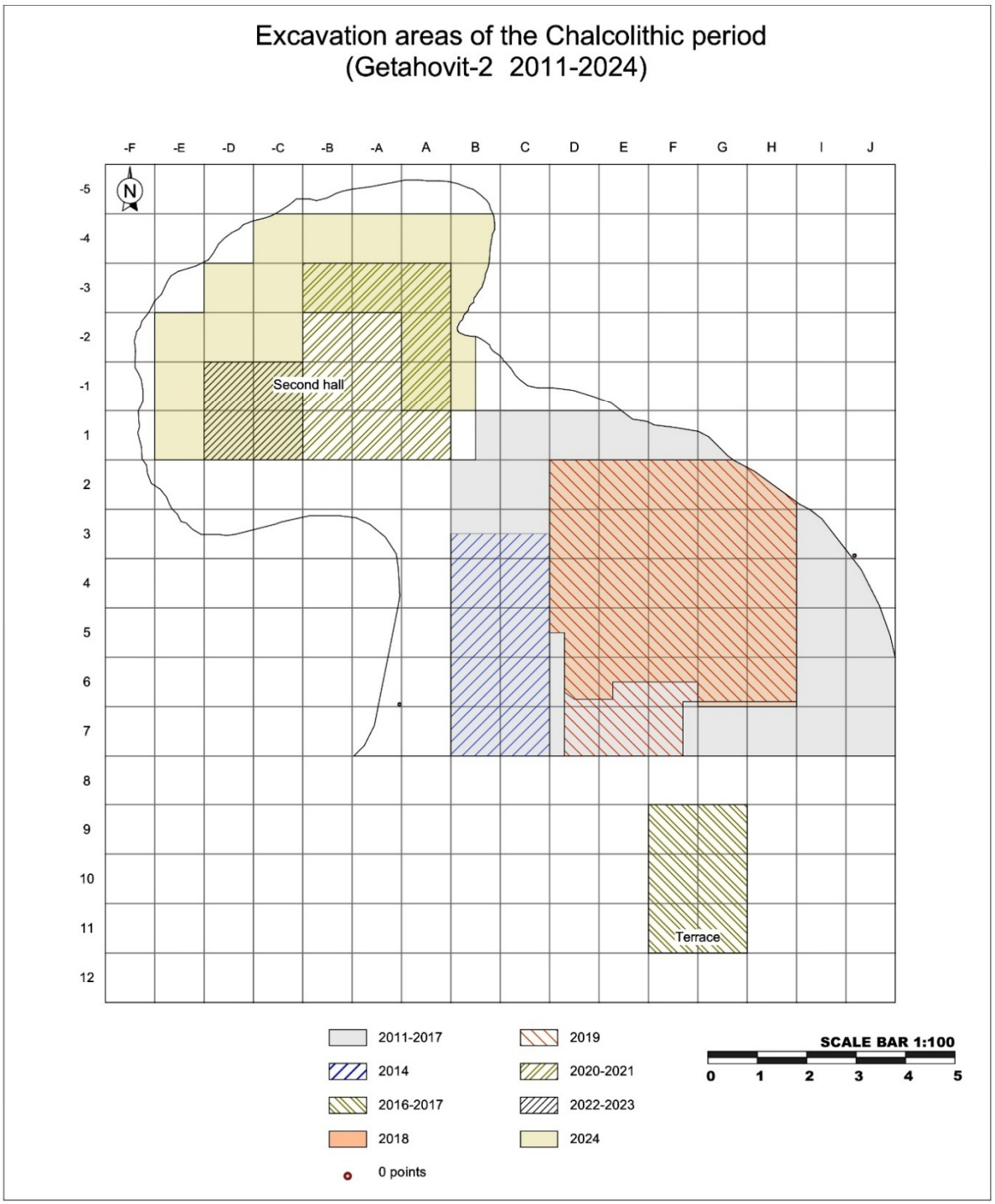


Fig. 3. The cave of Getahovit-2: Plan of the first and second spaces of the cave with the separation of the work volumes (Chalcolithic period) (drawn by architect N. Hakobyan).
Peștera Getahovit-2: Planul primului și celui de al doilea spațiu al peșterii și separarea zonelor de lucru (perioada calcolitică) (desenat de arhitectul N. Hakobyan).

For further investigations, the small (nearly 64 square meters) cave with two halls – Getahovit-2 – was selected (fig. 3). During the first year of excavations carried out on 4 m², it was obvious that the site primarily presented the Medieval (9th-13th century AD) and Chalcolithic period layers (4360-4320 BC) (Kalantarian *et alii* 2012, p. 8-9).

The most important information came after opening the deep trench at the western part of the cave. It was done for the discovery of the whole potential of the site. The results were very promising; layers of a few Chalcolithic strata or horizons, as well as a unique transitional layer from Late Neolithic to rarely evidenced Early Chalcolithic in the region, and finally, the layer of Upper Palaeolithic period occupation, which was separated from the rest with the nearly sterile sediments of geological origin were securely confirmed with the help of radiocarbon dates.

For the first time in Armenia, the multidisciplinary research of the mentioned periods was conducted across such a broad spectrum. The excavations at the Getahovit-2 cave were initiated in 2011 jointly with the French part, and since 2018, the investigation activities at the site have been carried out with the IAE expedition team, kindly supported by the owner and administration of the "Ijevan Wine and Brandy" company. Since 2021, the scientific team from Warsaw University has been collaborating, focusing on the Neolithic and Upper Palaeolithic issues.

General stratigraphy

The site comprises various archaeological periods, the earliest of which, discovered first in 2014 and after that in 2022, belongs to the Gravettian culture (Level VII). This Upper Palaeolithic period first appears at a depth of around 3.2 m, with its northern limits resting directly on the bedrock, which is steeply sloping in the excavated area. However, the virgin soil has not yet been reached on the terrace side, where other earlier levels have probably yet to be discovered. In Level VII, dated to 22020-21685 cal BC (Beta-393561: 19770 +/- 70 BP), faunal remains, charcoal, and a lithic industry made of obsidian microliths have been discovered. Fundamental research was recommenced in 2021 in order to accumulate knowledge about this unknown period for the region. Valuable results have been obtained concerning this period (Kalantaryan *et alii* 2022). The research has revealed the presence of another horizon (18a), attributed to the transitional phase from the Late to Middle Upper Palaeolithic, at the site.

This Level VII lies beneath two different geological strata. The first layer (Level VI), with very compact and stony deposits, is characteristic of a period of gelifraction and corresponds to the cold phases of the end of the Pleistocene, from the Late Glacial Maximum to the Younger Dryas. The second layer (Level V) consists of a very compact clayey sediment characteristic of deposits accumulated under a warmer, more humid climate and corresponds to the early Holocene (Chataigner *et alii* 2020, p. 3) (tab. 1).

The next known stratum is the Late Neolithic period (Level IV). A few layers were uncovered, primarily characterized by fireplaces, with obsidian pieces mostly accumulated around them. At least four horizons have been confirmed by ^{14}C dating (Kalantaryan *et alii* 2021).

The transitional period from the Late Neolithic to the Early Chalcolithic is also attested at the site. It is the period that is really rarely represented in the region. The first evidence was confirmed in 2014. The last season's excavations at the site and the radiocarbon dates (tab. 1) confirmed the existence of the period once more.

Chalcolithic horizons (Level III) that clearly present two phases of the period, mostly early-middle time sequence with few late dates (between 4624 and 4171 cal BC, for the calibrated median values of the dates). Excavations we have carried out in the last years have undoubtedly added new data, showing that the earliest phases of Chalcolithic are also presented inside the cave (Horizon 7-8).

The Late Neolithic and Chalcolithic levels are made up of alternating blackish, light grey/whitish, and brownish layers, indicative of the use of the cave as a sheepfold with periodic cleansing by fire.

Finally, separated by the sterile stratum (Level II) from the Chalcolithic, the medieval period (Level I) with its very well-stratified horizons completes the stratigraphical picture of the site (Kalantaryan, Babajanyan 2021).

Chronological chart based on radiometric dating (Getahovit-2 cave)										
Code Lab.	Year	Square	Context	Material	Date BP	Cal AD 95%	Median	Level	Horizon	Phase
										Medieval
Lyon-10370 (SacA-34117)	2012	D 7	US 3 , Tomb St. 10	charcoal	1060±30	897-1024	987	I		
Lyon-13486 (SacA-47796)	2015	G 3	St 81, (child tomb)	charcoal	980±30	993-1155	1076			
LTL-12043A	2011	C 7	US 3	charcoal	933±45	1021-1206	1102			
	2012		US 3d-e, US21					II		Sterile
						Cal BC 95%		III		Chalcolithic
								III a		Middle
Lyon-13484 (SacA-47794)	2015	I 6	St 97	charcoal	5340 ± 35	4316-4051	4171		1a	
Lyon-13483 (SacA-47793)	2015	I 6	US 30	charcoal	5400 ± 35	4341-4077	4276		1b	
Lyon-13482 (SacA-47792)	2015	E3	US 32	charcoal	5420 ± 35	4346-4179	4287			
Lyon-13485 (SacA-47795)	2015	I 4	St. 127	charcoal	5435 ± 35	4347-4050	4291			
Lyon-11540 (SacA-38689)	2013	B5, US05	US 5	charcoal	5485 ± 40	4447-4258	4339		2	
BETA-306022	2011	C7	US 5	charcoal	5490 ± 30	4445-4262	4342			
Lyon-10368 (SacA-34115)	2012	D 6	US 4	burnt bone	5520 ± 30	4449-4331	4363			
Lyon-10369 (SacA-34116)	2012	D 6	US 5	charcoal	5575 ± 30	4458-4353	4406			
Poz-97044	2016		US42/45	charcoal	5590 ± 50	4519- 4343	4417		3	
LTL-14985A	2014	B4/B5	US 8 St 65	charcoal	5626 ± 45	4541-4360	4455			
			US 9-10 US 46, 47						4	
			US11 = US48						5	
	2018	H 6	St. 187	charcoal	5640 ± 30	4542-4371	4474			
	2018		US 49			Mud			6	
								IIIb		Early
LTL-14986A	2014	C 7	US 13, St. 69	charcoal	5719 ± 40	4681-4456	4562		7	
BETA-510629	2018	H 6	US 57, next toSt 204	charcoal	5770±30	4703-4545	4624			
Poz-148434	2020	H 5	US 64, St.226	charcoal	6010 ± 40	5002-4793	4900		8	
										Transition
LTL-U14987A	2014		US 14, St. 71	charcoal	6174 ± 45	5289-4995	5127		9	
						Cal BC 95%		IV		Neolithic
								IV a		Late
Poz-148677	2020	G, H 4	US 65, St. 233	charcoal	6300 ± 50	5377-5206	5269		1	
Poz-148678	2020	H 4, 5	US 67, St. 235	charcoal	6450 ± 50	5481-5313	5414		2	
BETA-675065	2021	E 7	US 69-70, St 242	charcoal	6470 ± 40	5512-5331			3	
			US 71-72						4	
BETA-675066		G, H 5, 6	US 74, St 252	charcoal	6670±30	5656-5526			5	
	2014		US 15					V		Sterile
	2014		US 16					VI		Sterile
								VII		Upper Paleolithic
										Middle - Late
BETA-393561	2014	B 6	US 18, St 73	sediment	19770 ± 70	22020-21685	21834		1	Late
Poz-166964	2022	C 6	US 18a	charcoal	23510 ± 190	25351-26046			2	Middle
Poz-166220	2022	E 6	US 81	charcoal	23660 ± 180	25445- 26337			3	

Tab. 1. ^{14}C dates for Getahovit-2, periods, and the horizons of the site.
Datele ^{14}C de la Getahovit-2, perioadele și orizonturile sitului.

Chalcolithic layers

As mentioned above, there are nine horizons attributed to the Chalcolithic period (Level III), defined by the intensity and duration of occupation.

Horizon 9 corresponds to a transitional phase between the Late Neolithic and Chalcolithic levels. The layers are defined by traces of destruction. In some areas, particularly in the southern sections, parts of the layers were damaged and showed evidence of intense

fire. Although no pottery was discovered, it is noteworthy that well-constructed structures were clearly visible beneath the destruction (Kalantaryan *et alii* 2021, p. 72).

Horizons 8 and 7 are attributed to the Early Chalcolithic period and exhibit stratigraphic layers that differ markedly from those of preceding phases. Numerous combustion features – including fireplaces and hearths with evidence of reuse – characterize these levels. The abundant bone fragments, bone tools, and obsidian recovered indicate intensive activity. Moreover, the pottery assemblage from these contexts displays typological distinctions from previously encountered ceramic forms (Kalantaryan, Ghanem 2019).

Horizon 7 is covered by a layer of mud (Horizon 6) over most of the cave. This mud, about 10 cm thick and carrying many stones, entered the cave from the south-east end of the porch; this phenomenon is probably due to a large stormy event (Kalantaryan, Ghanem 2019, p. 8).

Horizons 6 to 1 belong to the middle phase of the Chalcolithic period, with the last horizon numbered 1 comprising two divisions 1a and 1b.

Concerning the early horizons 5 and 4 (Level III), the evidence suggests a relatively simple occupation of the cave by herders, without substantial structural remains. At the same time, there are clear indications of the cave's use as a shelter for cattle, such as the presence of a rudimentary – one might even say primitive – urinary system (Chataigner *et alii* 2020, p. 5; Tardy, Kalantaryan 2016, p. 46).

The horizons 3, 2, and 1b were different by the intensive usage that was proved by the structures and the finds, especially pottery. They are characterized by the signs of relatively long camping in the cave. The quantity of pottery, obsidian, and bone remains, tools, and structures such as pits can indicate the idea.

And finally, another phase of Horizon 1a seems to be episodic. The particularities appeared after the sterile immediately, although there are well-structured hearts and the hunters' halt was perfectly visible (tab. 1).

Horizons and pottery assemblages

A brief review of the horizons attributed to the Chalcolithic period has been conducted, revealing that interpretations can vary based on the pottery finds, their quantities, and their typological characteristics. This chapter focuses on examining these horizons concerning the identified pottery assemblages. A total of 679 ceramic fragments has been counted, analysed, and categorized across the horizons. Notably, 21 of these sherds exhibit unique technological characteristics, which will be discussed separately and integrated as a valuable addition to the broader assemblage.

Before delving into the discussion, it is crucial to acknowledge the challenges inherent to cave excavations. In general, limited material recovery is a common feature. Additionally, some degree of disturbance caused by natural or anthropogenic intrusions is common, which can result in chronological inconsistencies within stratigraphic layers. As a result, diagnostic fragments may sometimes appear in stratigraphic layers that are either later or earlier than expected, complicating their contextual attribution to specific horizons or subgroups. To address these complexities, only the most reliable pottery examples will be included in the assemblages that define and complete the horizons.

Due to the express study, which was kindly done by a specialist from the Institute of Geological Sciences of NAS RA, it was possible to identify some inclusions observed inside the clay mixtures. It is important to acknowledge that the percentages provided in the analysis reflect the composition of the small sample taken for study and may not fully represent the overall consistency of the entire clay mixture used in the pottery. Variations in the clay

composition within a single sherd or between different sherds could arise due to natural heterogeneity in the raw materials or the potter's practices.

This express study offers a valuable snapshot of the materials used, but it is possible that larger or more representative samples could show different proportions of inclusions like clay carbonate, limonite, quartz, volcanic glass and winded, iron particles. It might be useful to conduct further studies on a broader range of samples or even consider using additional methods such as thin section petrography or X-ray diffraction (XRD) to get a more comprehensive understanding of the mineralogical composition and its variability within the assemblage.

Although preliminary, the study provides valuable insights into the origins of certain inclusions. The whitish particles are predominantly carbonates, while the brownish ones likely represent limestone undergoing incipient iron oxidation.

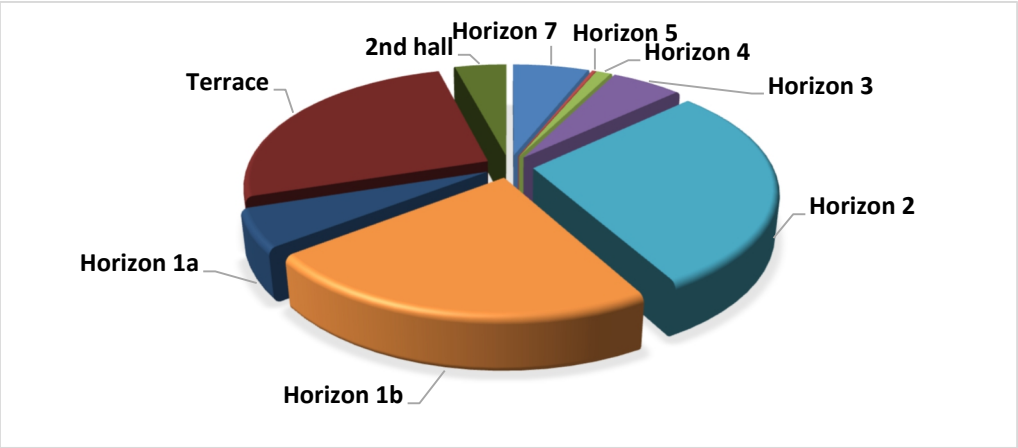


Fig. 4. Pottery distribution by horizons.
Distribuția ceramicii pe orizonturi.

◈Description of the pottery (fig. 4)

Main hall of the cave

Horizon 7 (Level IIIb Early Chalcolithic)

The early horizon (7a, 7, tab. 2, 3) is characterized by a distinct and highly dynamic organization of daily life. The whole, mostly the central and eastern sectors of the area inside the cave, were used as small "workshops" for treating the obsidian, also creating a large quantity of bone tools. This industry shows the whole fabrication alternation. The different kinds of tools and adornment present started from the rude primitive preparations up to the tender, well-polished pendants and beads (Zarikian, Kalantaryan 2021, p. 78-83).

There was an abundance of fireplaces; moreover, in the majority, they were reused during multiple visits to the cave, and in some cases, they were replaced with new ones. All obvious hearths were located along the same north – south line in squares G-H and had approximately the same sizes. The 7a was the first phase of the occupation. Two big fireplaces with the presence of charred grains in the ash remains were located in the eastern part. The western part had the combustion areas, and the layers consisted of remnants of coprolites mixed with the clay (Kalantaryan, Ghanem 2019, p. 9-10).

The pottery examples were not too many. Unlike the rest of the Getahovit-2 assemblages, this group has the majority of organic in the clay temper (tab. 3). The outer

surfaces also exhibit different treatments and types of slip, particularly the red slip, which can be compared to those found at the Mentesh and Rabati sites (Lyonnet 2017, p. 142-143, fig. 6; Kalantaryan, Ghanem 2019, p. 12-14; Bedianashvili *et alii* 2019, fig. 19/5-6). The horizon showed the comparatively early phase of the period (tab. 1-2, pl. 1). In general, 42 sherds had been found, of which the diagnostic ones are six.

Horizon	US (2014)	US (2018-2019)	Depth (m)	Date BC (95.4 %) / Median BC	Quantity of sherds	Plate
7	13	51,53-55	2.18 / 2.20 – 2.26 / 2.35	US 13:4681-4456 /4562	26	1/1, 3-5
7a	13A	57-58	2.26 / 2.35 – 2.39 / 2.48	US 13A:4709-4542 /4624	16	1/2

Tab. 2. Stratigraphy and ^{14}C dates for the Chalcolithic layer – horizons 7 and 7a.
Stratigrafia și datele ^{14}C pentru nivelul eneolitic – orizonturile 7 și 7a.

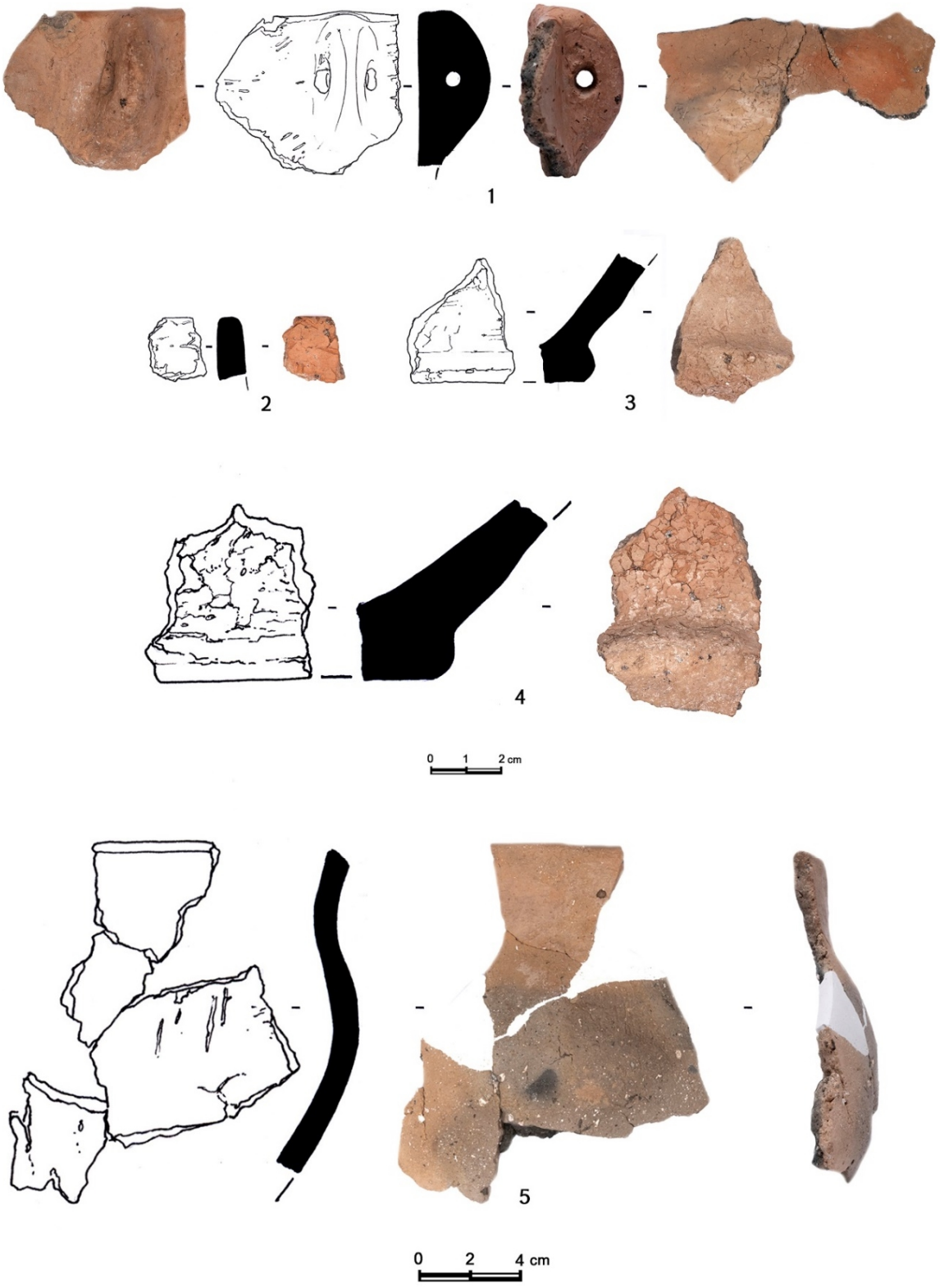
№	Exc. Year	Sq.[1]	US	ST	Museum №	Part	Temper	More	Plate
1	2018	F3	51		0023	Rim part with handle	Chaff (+ grit in minority)	Vertical handle with perforation, Obsidian is in temper	1/1
2	2018	F3	51		0017	Body	Chaff (+ grit in minority)	It is probably part of the previous pot	1/1
3	2018	E3	51		0019	Base	Chaff (+ grit in minority)	Shiny sand	1/4
4	2018	E3	51		0020	Base	Chaff (+ grit in minority)		1/3
5	2018	F6	57		0022	Rim	Chaff and grit		1/2
6	2018	H2	54		0021	Rim	Chaff (+ grit in minority)	Shiny sand + obsidian	
7	2018	E3, 5	51		0018	Rim with body	Grit (+minerals)	Whitish sand	1/5

Tab. 3. Ceramics' qualitative and quantitative evidence for Chalcolithic layer – horizons 7 and 7a.
Datele calitative și cantitative ale ceramicii pentru nivelul eneolitic – orizonturile 7 și 7a.

The most presentable one is a relatively big pot with a slightly convex body. As one might suppose it is composed of 16 definite fragments including a rim sherd with a vertical perforated handle that more likely belonged to the same pot (pl. 1/1). The interior and exterior parts of a few sherds were damaged apparently because of some unfavourable conditions. They have uneven exterior colour varying from 7.5YR 6/4 light brown to 2.5YR 6/6 light red. The interior surface colour can be interpreted as 5YR 6/3 light reddish brown, as well as the greyish colour spots on surfaces and sections, which indicates not complete oxidizing. In the case of inclusions chaff and

[1] Abbreviations: Sq = square; ST = structure; US = stratigraphic unit.

sand are visible, but chaff inclusions prevail. Non-organic, sand inclusion content are around 10 percent and sizes of angular grains varying from 1 to 5 mm. Inclusions are fairly sorted.



Pl. 1. Pottery examples from horizon 7: 1. US 51; 2. US 57; 3. US 51; 4. US 51; 5. US 51.
Exemple de ceramică din orizontul 7: 1. US 51; 2. US 57; 3. US 51; 4. US 51; 5. US 51.

The pot is hand made using slab-building techniques. In the case of some sherds, the edges of clay bands are visible in sections.

The exterior surface is smoothed and slightly burnished. The interior surface is smoothed with traces of burnt organics. The surface of the interior is poorly preserved; firing is uneven (Kalantaryan, Ghanem 2019, p. 13).

The group of the early horizon was completed with a handmade tripartite in-section vessel that was being manufactured using slab-building, *i.e.* the joined parts of two bands/slabs can be seen (pl. 2/5, 0018). Morphologically, the pot has a cylindrical neck where the rim is bevel-edged and has a convex shoulder. The colour of both surfaces is 10YR 7/4, very pale brown. As for surface treatment, both surfaces are smoothed. The inclusions are mainly whitish sand (10-20%), sized 1.0-4.0 mm. The shape of the sand grains is angular. Sorting is fair. Typologically, and by the similarity of the clay matrix, an analogy for this pot comes from the Chalcolithic site Teghut, where simple pottery made with sandy inclusions in paste prevails (Torosyan 1976, tab. IV, V-1).

The group is completed by two small rim fragments and two base fragments, but their advanced state of fragmentation prevents identifying their original forms.

Horizon 6 (transition between Levels IIIb and IIIa)

The sixth horizon had been composed of sludge deposits from the mudflows. It entered the cave and covered the whole part of the hall. Also, a lot of small stones had been brought inside by the flow. In the southern parts, its thickness reached ca. 10 cm. The top surface of the said muddy sediment had cracks filled with fine sand that appeared because of the long stop of water (Kalantaryan, Ghanem 2019, p. 8).

Horizon 5 (Level IIIa)

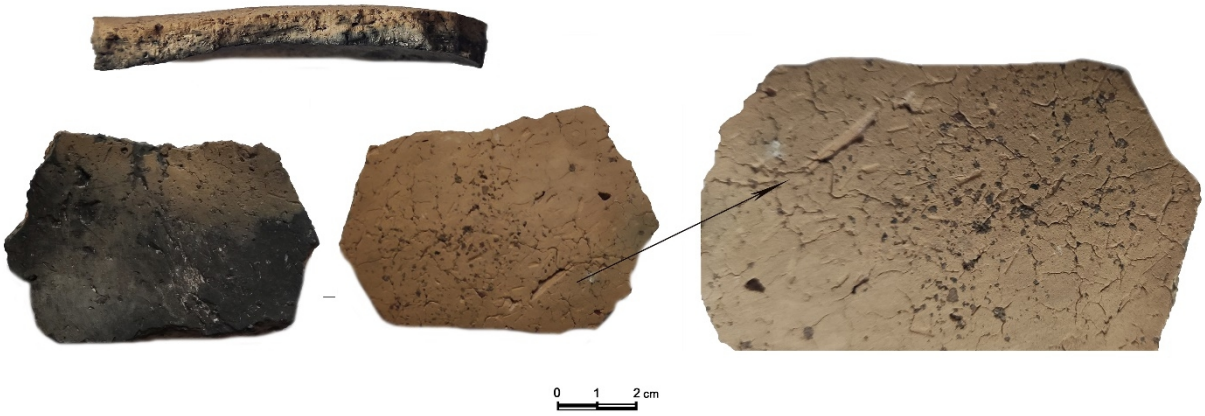
For the moment, the fifth horizon was the poorest one. The visits during this time were probably more episodic. Few fireplaces of brief use can confirm the short presence of visitors inside (Kalantaryan, Ghanem 2019, p. 8), (tab. 4). Also, the concentration of relatively big stones was located close to the northern limits. Unfortunately, it had not any clear constructive shapes.

As it is visible from the table, only one sherd had been found. The clay was organic homogeny mostly mixed with fine, shiny sand. Obsidian is also present in the list of inclusions.

The surfaces are smoothed but without any slips. They are matte, the colour is 10YR 7/4, a very pale brown, and the brownish mineral particles (nearly 1 mm sized) are visible on the smoothed external face (pl. 2).

Horizon	**US (2012-2014)**	**US (2015-2018)**	**Depth (m)**	**Date BC (95.4%) / Median BC**	**Quantity of sherds**	**Plate**
5	11-12	48, 50, 52	2.02 / 2.10	US 12:4542-4367/ 4474	(chaff ware grit in minority)	2

Tab. 4. Stratigraphy and ^{14}C dates for the Chalcolithic layer – horizon 5.
Stratigrafia și datele ^{14}C pentru nivelul calcolitic – orizont 5.



Pl. 2. Pottery examples from horizon 5: US 48.
Exemple de ceramică din orizontul 5: US 48.

Horizon 4 (Level IIIa)

The activity within this occupation layer is primarily evidenced by a few empty pits. A fireplace was identified in the south-eastern part of the site, and small stone concentrations were found near the cave's eastern walls. Animal bones were also recovered, suggesting that the inhabitants used the western part of the cave as a corral for sheep and goats. Pottery sherds were sparse, but noticeable changes in style and temper were observed compared to earlier horizons (tab. 5-6).

Horizon	US (2012-2014)	US (2015-2018)	Depth (m)	Date BC (95.4%)	Quantity of Sherds	Plate
4	09-10	46-47	1.86/1.88 – 2.02	Predated 4455 Postdated 4474	8	3

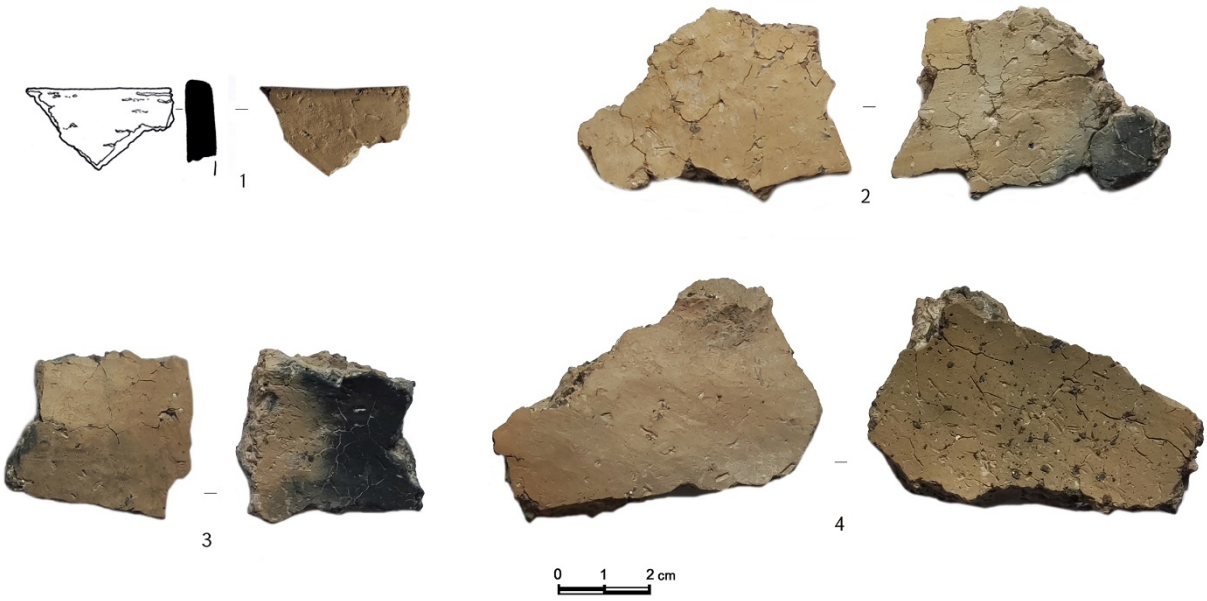
Tab. 5. Stratigraphy and ^{14}C dates for the Chalcolithic layer – horizon 4.
Stratigrafia și datele ^{14}C pentru nivelul calcolitic – orizont 4.

№	Exc. Year	Square	US	ST.	Museum №	Part	Temper	Decoration	More	Plate
1	2017	G6	47		0027	Rim	Grit (chaff is in a very low percentage)		Obsidian is in temper	3/1
2	2018	G1	46			Body	Grit (chaff is in a very low percentage)		Big pieces of grey mineral inclusions	3/2
3	2018	G1	47			Body	The same		The same	3/3
4	2018	G1	47			Body	The same		The same	3/4

Tab. 6. Ceramics' qualitative and quantitative picture for Chalcolithic layer – horizon 4.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont 4.

The pottery clay primarily consists of grit, with large brownish shiny mineral particles (approximately 2-5 mm in size) visible both within the clay matrix and on the external surfaces. Smaller quantities of white mineral inclusions and traces of obsidian are also present. The clay has a naturally shiny appearance, while organic inclusions are minimal (pl. 3/2-4).

The sherds are predominantly 10YR 7/3 (very pale brown) in colour. The only diagnostic piece is a rim fragment with a flat top (pl. 3/1), which is 7.5 YR 6/4 (light brown) in colour.



Pl. 3. Pottery examples from horizon 4: 1. US 47; 2. US 46; 3. US 47; 4. US 47.
Exemple de ceramică din orizontul 4: 1. US 47; 2. US 46; 3. US 47; 4. US 47.

Horizon 3 (Level IIIa)

This horizon is composed of at least two layers and is more attractive because of the raised quantity of pottery. The earlier horizon (3b) had been marked by the sharp attributes of herders' presence (tab. 7). It had been composed of whitish layers consisting of the burned, continuously unburned coprolites mixed with clay-composed masses. Activity here was approved by the comparable abundance of structures, especially pits that were placed on a north-west – south-east line, close to the caves' wall. The most interesting and rich in materials was a pit (structure N 65) discovered in the eastern part, from where the big pot with the horizontally applied lug was found.

The barrel-shaped or cylindrical vessel (pl. 4/5) discovered in the pit warrants special attention and a separate discussion. This kitchenware features a straight, rounded rim and slightly convex body walls. A horizontal lug handle is attached to the middle of the body, and although the pot is only half-preserved, it raises the possibility of a second, parallel handle. The vessel is handmade, with a smoothed surface. Its thick-walled base is flat and has a protruding outer edge.

The exterior surface is slightly burnished, while the interior is smoothed. The vessel is grit-tempered, with a clay matrix containing fine to medium-sized mineral inclusions. The firing conditions were uneven, creating an oxidizing atmosphere. The exterior coloration

ranges from light reddish brown (5YR 6/4) to dark reddish grey (5YR 4/2), while the interior maintains a consistent light reddish brown (5YR 6/4).

One notable piece is a rim fragment (pl. 4/1), likely representing a pot type with a short neck and broad shoulders. Its outer surfaces are well-treated with slips, although matte finishes are also observed. The sand is shiny, and the clay matrix includes obsidian and grey mineral inclusions. While the fragment's morphology is challenging to determine with certainty, it appears to originate from a vessel with a short neck attached to a high-shouldered body. A comparable example can be found at the Adablur site (Areshyan 1991; Masson *et alii* 1982, p. 155, tab. XLIII/15, 16; Abedi *et alii* 2014, p. 122, figs. 21/ 5-6, p. 126; 25/5-6).

An interesting structure made with burnt clay was unearthed. It might have clear connections with urine drainage. Moreover, structures like the "pavements" were built of very simple, hand-made sherds had been discovered close to the cave's walls. These could also be the ceramic remains of some stationary vessels. On one of these pieces the imprint of beetle larvae was discovered; that can be the fact of preparing the ceramics inside the cave where the area of beetles was very active. According to scholar Margarit Marjanyan's study[2], it belongs to the beetle larva, a water-loving Hydrophilidae belonging to the subfamily of the tribe (Sphaeridium) (Insecta, Coleoptera, Sphaeridiinae). This type of bug generally lives in dung, preferring the fresh one (pl. 4/4). The pottery remains from this layer closely resemble those found in Horizon 4, and the clay matrices (tab. 1) show similar consistency. This is further supported by mineralogical express analyses. Some fragments (US 44, G 5, 6) contain a higher percentage of chaff inclusions in the clay. Obsidian is also present in the clay mixture. In addition to the common colour spectrum, reddish-brown hues are also present.

One fragment was analysed in terms of its mineralogical composition.

- *Getahovit-2 2016, the body fragment from the horizon 3, US 45 F 4-5*

The scraped material is mainly composed of weathered grains and clay – about 80%, volcanic glass about 12%, which are probably part of visible volcanic rock fragments, diatoms – 4%, phytoliths that have been burned – 2%, and seeds – 2%.

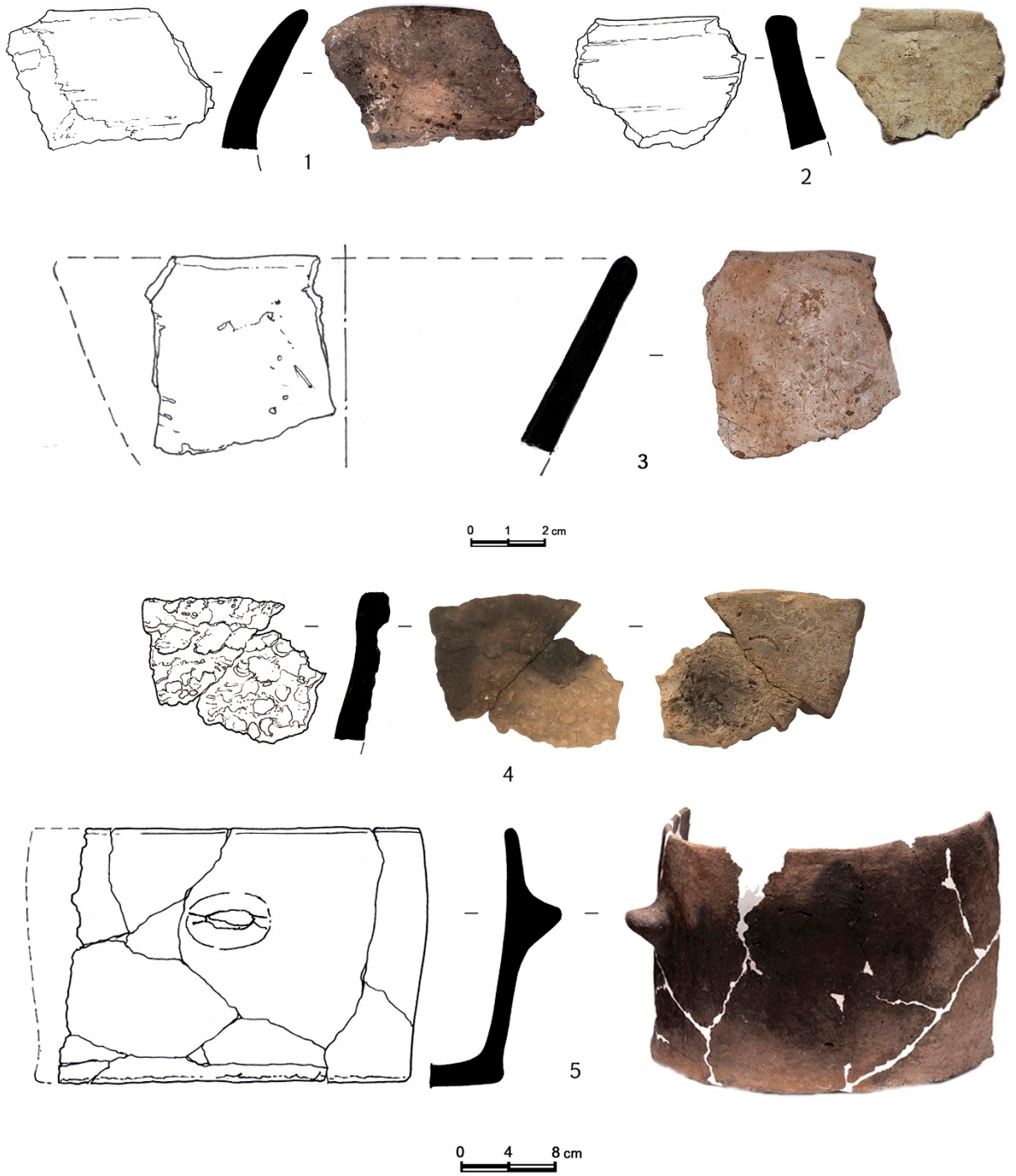
The later horizon, identified as 3a, appears to represent a period of reduced activity. Evidence of a prolonged hiatus is visible, such as plant shafts that formed post holes (US 38-39) between horizons 3 and 2. Pottery rim fragments from this layer are notable for their light coloration and clay compositions enriched with chaff inclusions. In some cases, the chaff mixture dominates the fabric entirely (pl. 4/2-3).

The pottery assemblage from this horizon is characterized by clay matrices containing grit (including obsidian, brownish stones, and shiny sand) combined with a small percentage of organic material. In some instances, the proportion of organic inclusions increases significantly. Among the analysed sherds, eight show an elevated presence of chaff mixture. Surface treatments vary, ranging from well-polished to untreated examples. This horizon's pottery assemblage, particularly the earlier, lower segment, demonstrates strong parallels with the preceding horizon 4. The clay matrices share similarities, and morphological features appear consistent. However, the presence of chaff ware fragments distinguishes horizon 3a from its preceding stratum (tab. 8).

[2]M. Marjanyan was a scholar from the Scientific Center of Zoology and Hydroecology of NAS RA.

Horizon	US (2012-2014)	US (2015-2018)	Depth (m)	Date BC (95.4%) / Median	Quantity of Sherds	Plate
3	06	38-42	1.45/1.66 –??	4536-4344 / 4417	15	4/2-3
3b	07-08	43-45	1.60/166 – 1.76/1.80	4543-4357 / 4455	24	4/1, 4-5

Tab. 7. Stratigraphy and ^{14}C dates for the Chalcolithic layer – horizon 3.
Stratigrafia și datele ^{14}C pentru nivelul calcolitic – orizont 3.



Pl. 4. Pottery example from horizon 3: 1. US 43; 2. St. 148; 3. St. 160; 4. US 45; 5. St 65.
Exemple de ceramică din orizontul 3: 1. US 43; 2. St. 148; 3. St. 160; 4. US 45; 5. St 65.

№	Exc. Year	Sq.	US	ST	Museum №	Part	Temper	Decoration	More	Plate
3b										
	2016	G2	43		0038	Rim	Grit and chaff (comparably high percentage of chaff)		Shiny sand, obsidian in low quantity and dark gray minerals	4/1
2	2014/ 2018	B4, 5	8	65	0022/ 005	Body half complete	Grit tempered		Horizontal handle or lug	4/5
3	2017	G2	45	175	0036		Chaff and grit		Beetle larva imprint. Obsidian and shiny particles inside	4/4
3a										
1	2016	H6		160	0034	Rim	Chaff prevails, grit in minority		Very creamy colour	4/3
2	2016	G4, 5		148	0035	Rim	Grit and chaff (comparably high percentage of chaff)		Creamy colour	4/2

Tab. 8. Ceramics' qualitative and quantitative picture for Chalcolithic layer – horizon 3.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont 3.

Horizon 2 (Level IIIa)

The layer revealed an intriguing situation, suggesting that the cave inhabitants resided there for a relatively extended period. The evidence forms a fragmented but cohesive picture, akin to assembling a puzzle. At the centre of the hall there was a large fireplace and a smaller hearth nearby. A stone alignment was positioned to the east, while pits were situated close to the cave walls. Activity areas, such as those for bone and obsidian processing, were predominantly found under the protective overhangs of the cave walls (tab. 9-10).

This horizon yielded a wealth of artifacts, including a significant quantity of pottery, obsidian, bone fragments, and tools crafted from bone, obsidian, and flint. Notably, much of the pottery was discovered within the pits. One exciting find was the remains of a small handmade bowl. The bowl featured a rounded base (Museyibli 2009-2010, p. 41) with a slip-covered exterior, bearing clear traces of meticulous burnishing. Despite its massive base, the

transitions between the base and body were seamlessly smoothed, creating an indistinct and well-integrated connection (tab. 10/5-6).

Horizon	US (2012-2014)	US (2015-2018)	Depth (m)	Date BC (95.4%)/ Median BC	Quantity of sherds	Plate
2	05	35-37	1.35/1.40-1.45	US 05: 4447-4258 / 4339 4445-4262 / 4342 4449-4331 / 4363 4458-4353 / 4406	197	5

Tab. 9. Stratigraphy and ^{14}C dates for the Chalcolithic layer – horizon 2.
Stratigrafia și datele ^{14}C pentru nivelul calcolitic – orizont 2.

№	Exc. Year	Sq.	US	ST.	Museum №	Part	Temper	Decoration	More	Plate
1	2016	G9	36	149	0029 and 0029/1	Rim	Grit and chaff in minority	Horizontally applied small ellipsoids row under the rim.	Has two fragments	5/2 5/3
2	2016	H4	36		0037	Rim-body	Grit and chaff		Consists of two fragments of different colours	5/1
3	2016	D4	37	158	0030	Rim-body	Grit and chaff in minority		The upper part is mostly preserved	5/5
4	2016	D1	36/37	167	0042	Base	Grit and chaff		White inclusions in the matrix	5/4
5	2016	F1	36/37	170	0040	Base	Grit and chaff		It seems to be the same with 0041	
6	2016	D1	36		0041	Base	Grit and chaff	Has 2 body pieces	Has 2 body pieces	
7	2016	I6	36		0039	Rim	Grit and chaff		Similar to 0057	

Tab. 10. Ceramics' qualitative and quantitative evidence for Chalcolithic layer – horizon 2.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont 2.

Pl. 5. Pottery examples from horizon 2: 1. US 36; 2. US 36; 3. US 35; 4. St. 167; 5. St. 158.
Exemple de ceramică din orizontul 2: 1. US 36; 2. US 36; 3. US 35; 4. St. 167; 5. St. 158.

The pottery assemblage of the second horizon shows a more diverse assortment of ceramics. For major examples here the grit matrices are porous, with a core that appears to be burnt. There are no visible mineral inclusions or obsidian. The pots are treated with slips that cover the surfaces. These slip layers are relatively thick and shiny, though they have cracks.

The best examples here include a relatively large, barrel-shaped pot found in a pit (pl. 5/5). Only the upper part of this vessel was recoverable. The barrel-shaped vessel (pl. 5/5) is kitchenware, with a slightly convex body wall. The top of the rim is flat and everted. The clay

matrix contains fine and medium-sized mineral inclusions. There are traces of burnt straw on the surface and sections of the vessel (up to five percent). Both surfaces are slightly burnished. The colour of the exterior and interior is uneven, with shades of 5YR4/6 yellowish red, 5YR3/1 very dark grey, and 5YR5/4 reddish brown. This pot is the only one in the Getahovit site's collection with such a rim shape. It parallels those from the Leilatepe culture (Museibli 2015; 2019), specifically the Late Chalcolithic site of Galayeri (Museibli 2019, p. 67, fig. 4). Another settlement, Boyuk Kasik, from the same Leilatepe cultural range also features vessels similar to this one. The jar belongs to the first group of "high quality" pots, composed of clay with vegetal inclusions (Museyibli, Huseynov 2008, p. 23, pl. XII/6). The parallel to such pots' rim is coming from the Yeghegis-1 rock shelter (Antonosyan *et alii* 2024, p. 5, fig. 3-W).

An example (pl. 5/2) of a small cup with a row of horizontally applied lugs placed just below the rim is interesting. It should be categorized as tableware and certainly belongs to the assemblage. The typical decoration for this period suggests a widespread distribution. Analogies can be found in Kviriastskali among the examples grouped in the second ceramic group (Varazashvili 1992, p. 28, tab. VIII/1-3), Damtsvari (Varazashvili 1992, p. 57, tabs. X/7-12, XI/11-12, XVIII/3, XIX/2-4), Tsitelgorebi. The Kvemo-Kartli range of sites may contain parallels, but these are not visible due to the fragmented nature of the materials (Masson *et alii* 1982, p. 143, tab. XXXI/3).

Some sherds demonstrate technological features, such as an example with a flat top rim and part of the body (pl. 5/1). The pot is hand-made using the slab-building technique. This technique is evident in the broken sections, which show distinctly different colours, possibly indicating that the vessel body was constructed by joining pre-made slabs. The colours observed are 7.5YR 6/3 (light brown) and 2.5YR 4/1 (dark reddish grey). An alternative explanation could be that some sherds were exposed to fire.

The presence of white sand grains within the clay matrix is particularly notable in the base example (pl. 5/4), indicating a coarser and more granular composition. Morphologically, the vessel exhibits a form that expands outward from a narrow base, culminating in a vase-like silhouette. The heel is subtly defined, and both the interior and exterior surfaces are smoothened. Despite significant damage, the vessel provides valuable insight into the potter's construction techniques. The base was formed by placing a rounded clay disc at the lowest point, around which wall strips or slabs were affixed. Subsequently, a smaller-diameter clay disc was positioned atop the initial base, and a thin layer of clay was applied to seamlessly integrate the components, smoothing the transitions between them. Morphologically, several transformations are evident. Vase-shaped vessels are now present alongside barrel-shaped ones. In terms of rims, there are both traditional simple types and newer forms, such as straight rims with flat tops and everted rims. These rims can be everted both inwards and outwards. An interesting base type has also appeared, rounded and covered with slip on the exterior, suggesting that some bowls were designed to have pedestals.

Horizon 1b

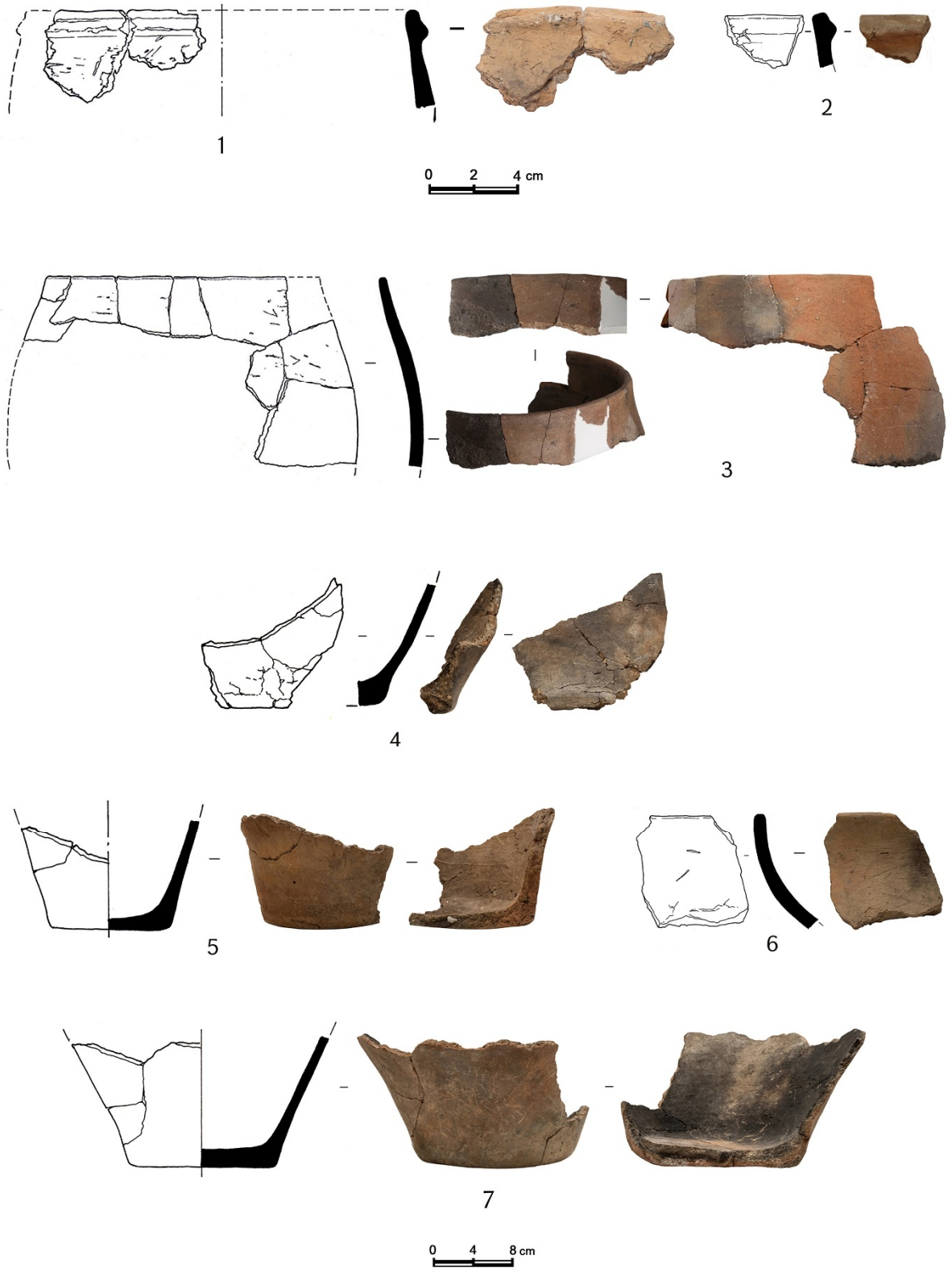
The horizon was difficult to identify. It seems that it was "cleaned" for unknown reasons before the sterile sedimentation was accumulated. In addition, the medieval period destructions did their role. We can argue its existence only by the appearance of separate structures such as fireplaces or the destructed pits (tab. 11). Some clear traces were visible close to the caves' wall limits, presenting the accumulation of bones and the lithics. The structure 37 excavated during the 2013 season must also be attributed to the layer, even though it was hardly disturbed by the medieval activities. The pottery was very fragmented (tab. 12, pl. 6-7).

Horizon	US (2012-2014)	US (2015-2018)	Depth (m)	Date BC (95.4%)	Quantity of sherds	Plate
1a		6, 8, 21	1.15/1.17 - 1.28	str. 97: 4316-4051 / 4171	32	**8**
1b	04	30-33	1.36 - 1.38	US 30: 4341-4077 / 4276 US 32: 4346-4179 / 4287 str.127: 4347-4050 / 4291	154	6-7

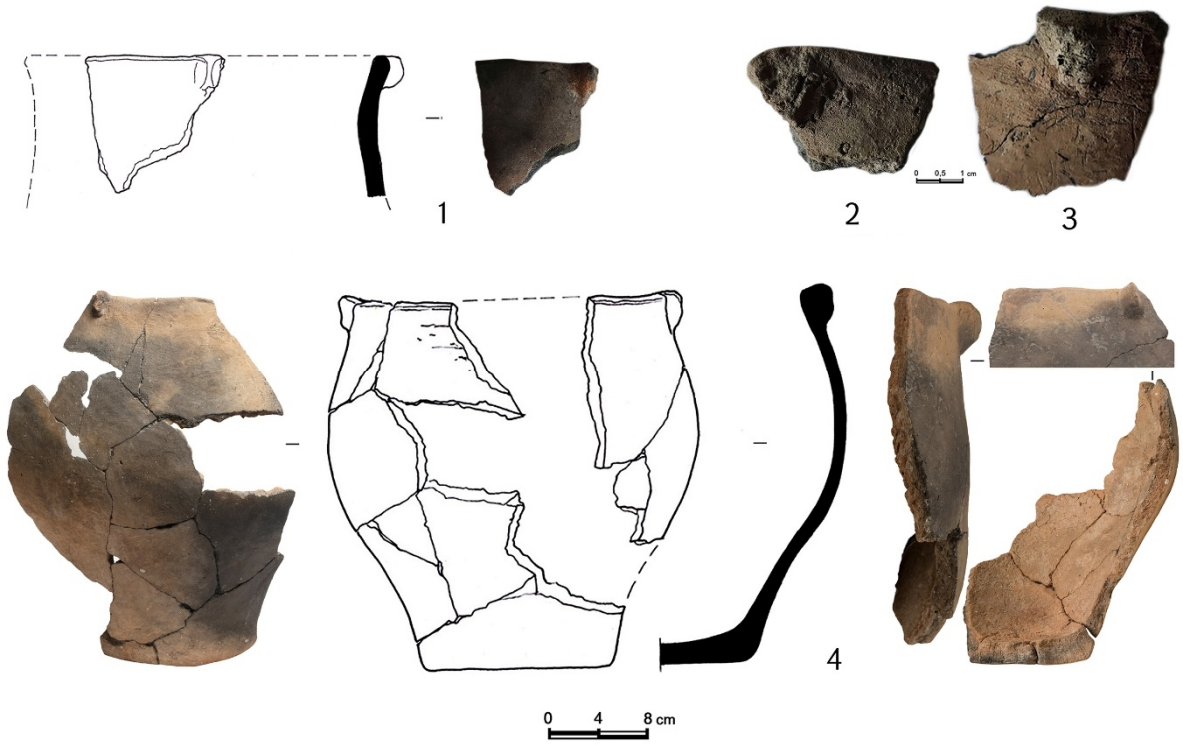
Tab. 11. Stratigraphy and ^{14}C dates for the Chalcolithic layer – horizon 1b and 1a.
Stratigrafia și datele ^{14}C pentru nivelul calcolitic – orizont 1b și 1a.

№	Exc. Year	Sq.	US	ST.	Museum №	Part	Temper	Decoration	More	Plates
1	2016	I,J - 5, 6	36/ 37	161	0036	Rim	Grit and chaff	Has a cornice under the rim	Has a big piece of stone in the matrix	6/ 1
2	2011	C 6	5		0010	Rim	Grit and chaff	Has a cornice under the rim	Has big pieces of stone in the matrix	6/ 2
3	2014	D,E - 6, 7	5		0023	Rim body	Grit	One of the fragments was burnt		6/ 3
4	2014	B 4,5	7		0022	Base	Grit	Must be the same as 0023		6/ 4
5	2013	C 3,4	4	37	006/1	Base	Grit temper		White inclusions	6/ 5
6	2013	G 3	36/ 37	24	004	Rim	Grit and chaff in		Has big pieces of stone in the matrix	6/ 6
7	2013	C 3,4	4	37	006	Base	Grit and very low percentage of chaff		White inclusions	6/ 7
8	2015	E 2	5		007	Rim	Grit	Vertical ellipsoid direct on the lip	White inclusions	7/ 1
9	2013	B,C 3,4	4	37	005,006, 007, 006/2	Half complete vessel	Grit	Vertical ellipsoids direct on the lip	White inclusions	7/ 4

Tab. 12. Ceramics' qualitative and quantitative evidence for Chalcolithic layer – horizon 1b.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont 1b.



Pl. 6. Pottery examples from horizon 1 (1b): 1. St. 161; 2. US 5; 3. US 5; 4, US 7; 5. St. 37; 6. St. 24; 7. St. 37, US 4.
Exemple de ceramică din orizontul 1 (1b): 1. St. 161; 2. US 5; 3. US 5; 4, US 7; 5. St. 37; 6. St. 24; 7. St. 37, US 4.



Pl. 7. Pottery examples from horizon 1 (1b): 1. US 5; 2. St. 103; 3. St. 146; 4. St. 37, US 4.
Exemple de ceramică din orizontul 1 (1b): 1. US 5; 2. St. 103; 3. St. 146; 4. St. 37, US 4.

Morphologically, this group consists of medium-sized pots (jars) with flat bases and vase-like shapes, characterized by slightly curved upper sections. Some clay mixtures incorporate white sand, with relatively large grains visible alongside fine sand (pl. 7/1, 4). Notably, almost all vessels in this subgroup include white sand to some extent in their clay matrix.

The best-preserved example from this group is a handmade kitchenware pot with a straight rim, thick walls, a swelling body, and a flat, smoothed base. It is decorated with vertically placed knobs or ellipsoid-shaped motifs along the rim (pl. 7/4). The exterior surface displays uneven colouring, ranging from light brown (7.5YR 6/4) to very dark grey (7.5YR 3/1), while the interior is light reddish brown (5YR 6/4). Although fragmented, the vessel's morphology is well-preserved. The form resembles a vase, with a rim that transitions into a slightly convex body, curving inward at the upper section. The clay paste contains visible pieces of sporadic straw stems, which were likely added as a temper. After constructing the jar, ancient potters applied thin layers of clay to cover the joints. These layers were made from a mixture containing fine, shiny sand.

The exterior and interior surfaces exhibit a slight sheen, likely due to the fine sand mixture. Interestingly, while quarts blackish shiny particles are visible in the applied clay layers, none are present in the main body of the vessel.

A base example (pl. 6/4) is interesting. The base is not sharply defined, and the body flares outward. The vessel is slip-covered on both sides, and the broken section reveals white inorganic inclusions along with a small amount of organic material. Its colour range aligns with earlier examples, closely resembling 10YR.

One notable example from this subgroup (pl. 6/6) features a well-sorted clay matrix with sporadic larger stony grains. The interior and exterior of its upper section are carefully polished, culminating in a flat, undifferentiated rim. The smoothing process left crosshatched

traces, possibly from a tool, and the surface displays a faint pinkish hue (10YR 7/3, very pale brown). The sherd also reveals technological details, including visible narrow clay bands on the interior. It is evident that the potters adjusted the width of the clay bands during fabrication to achieve the desired form and strength.

Horizon 1a (Level IIIa)

This horizon represents transitional layers, marking the beginning of sterile deposits between the Chalcolithic and Medieval periods. Stratigraphic observations suggest that Chalcolithic people visited the cave for a relatively short period, and evidence of their presence, such as fireplaces, has been partially destroyed, likely due to later activities.

The pottery found in the stratigraphically mixed layers, inside medieval intrusive pits of the site is also noteworthy and also displays distinct patterns.

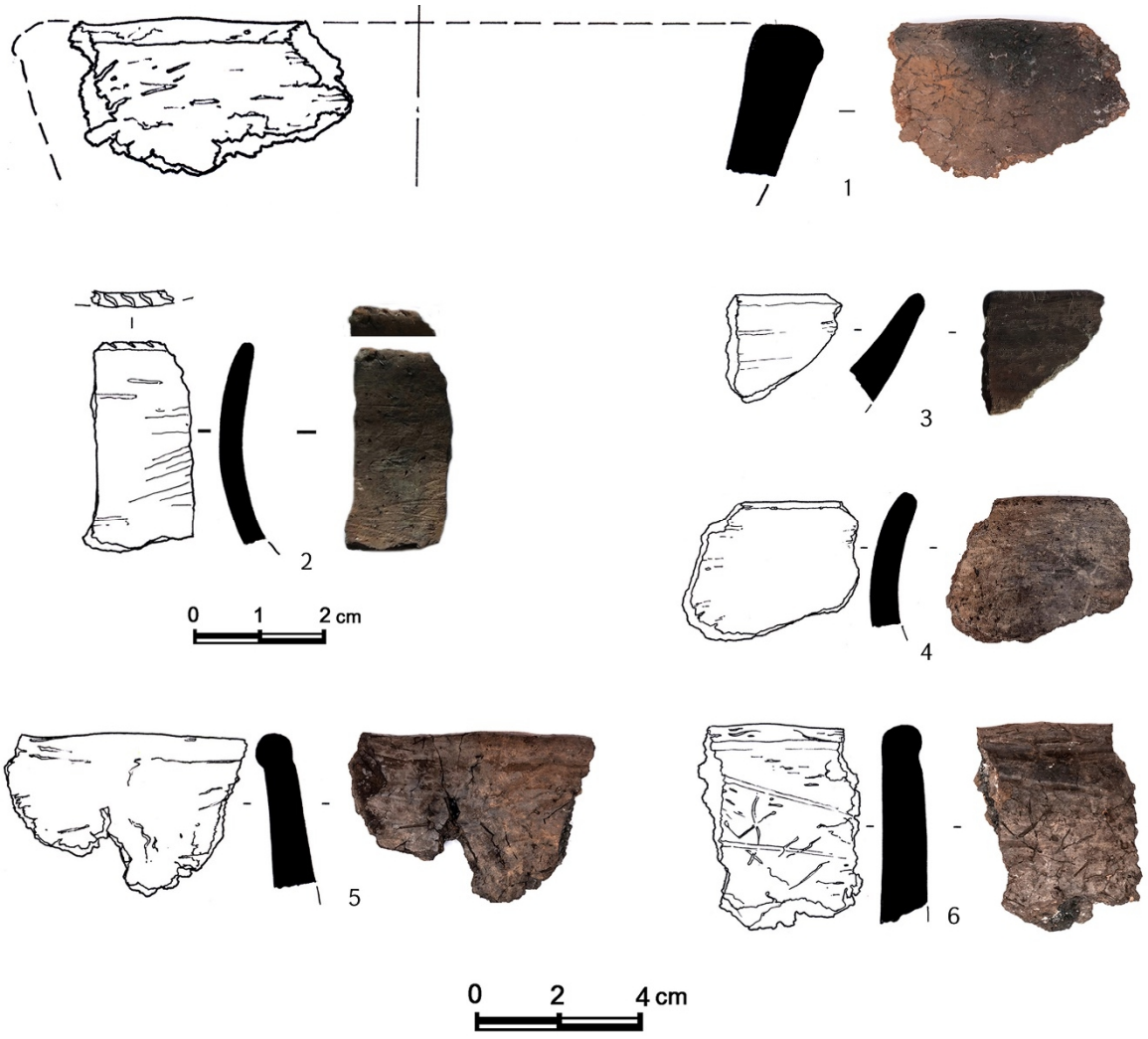
These fragments closely resemble the descriptions of Sioni ware, with characteristic features such as the presence of quartz and obsidian in the clay, a typical diagonally cut ornament on the rim (pl. 8/2), and comb patterns on the vessels' surfaces (Bedianashvili *et alii* 2019, p. 14).

The clay is not homogeneous, as if it is sheet-like, mostly with well-burnt interior. A little organic admixture is observed, as well as examples with the chaff mixture preponderated over are presented. The external surfaces are coated and treated. It is not possible to discuss the shapes of the vessels.

The analysis of pottery from this horizon is challenging, as the assemblage, especially its quantitative picture, was disturbed by medieval period activities.

№	Exc. Year	Square	US	ST	Museum №	Part	Temper	Décor.	More	Plate
1	2015	F3	3		0060	Rim	Grit		Shiny matrix	8/3
2	2015	G4	21/30		0055	Rim	Grit		Shiny matrix	8/4
3	2015	I6	8		0061	Rim	Grit	Notches on the rim	Obsidian included in temper	8/2
4	2015	F3	32		0053	Rim	Grit and chaff in minority			8/6
5	2015	E3	32		0056	Rim	Grit and chaff in minority			8/5
6	2015	D,E -4,5	32/33		0057	Rim	Grit temper			8/1

Tab. 13. Ceramics' qualitative and quantitative evidence for Chalcolithic layer – horizon 1a.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont 1a.



Pl. 8. Pottery examples from horizon 1 (1a): 1. US 32/33; 2. US 8, 3. US 3; 4. US 21/30; 5. US 32; 6. US 32.
Exemple de ceramică din orizontul 1 (1a): 1. US 32/33; 2. US 8, 3. US 3; 4. US 21/30; 5. US 32; 6. US 32.

A more distinctive diagnostic find is a rim fragment (pl. 8/2) from a very thin-walled cup (thickness: 0.5 cm), featuring transversely parallel incisions on the rim's top. The rim bends slightly outward, and the coloration differs between the sides: the exterior is either 10YR 4/2 dark greyish brown or 2.5Y 5/2 greyish brown, while the interior is 7.5YR 6/4 light brown. The internal surface is well-finished, and the clay matrix contains crushed obsidian (Lyonnet 2017, p. 146-147, fig. 12/a-d). Another diagnostic piece (pl. 8/4) is a rim fragment of a small jar with a well-polished outer surface. The gritty clay matrix is rich in silica (or maybe mica) and obsidian debris, and the surface colour is 7.5YR 5/1 grey. This type of pottery finds parallels most notably in materials from the Sioni site (Menadbe, Kiguradze 1981, p. 114, fig. 2/1-5, 15, 16).

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Sixteen non-diagnostic sherds with obsidian inclusions in the clay (pl. 9/2-3) were recovered from a later Chalcolithic layer (horizon 1a). The context was mostly mixed due to medieval occupation, and in some cases, the sherds appeared in sterile layers that separated these two periods. Six of these sherds display comb patterns (pl. 9/2, 5) on either the outer or

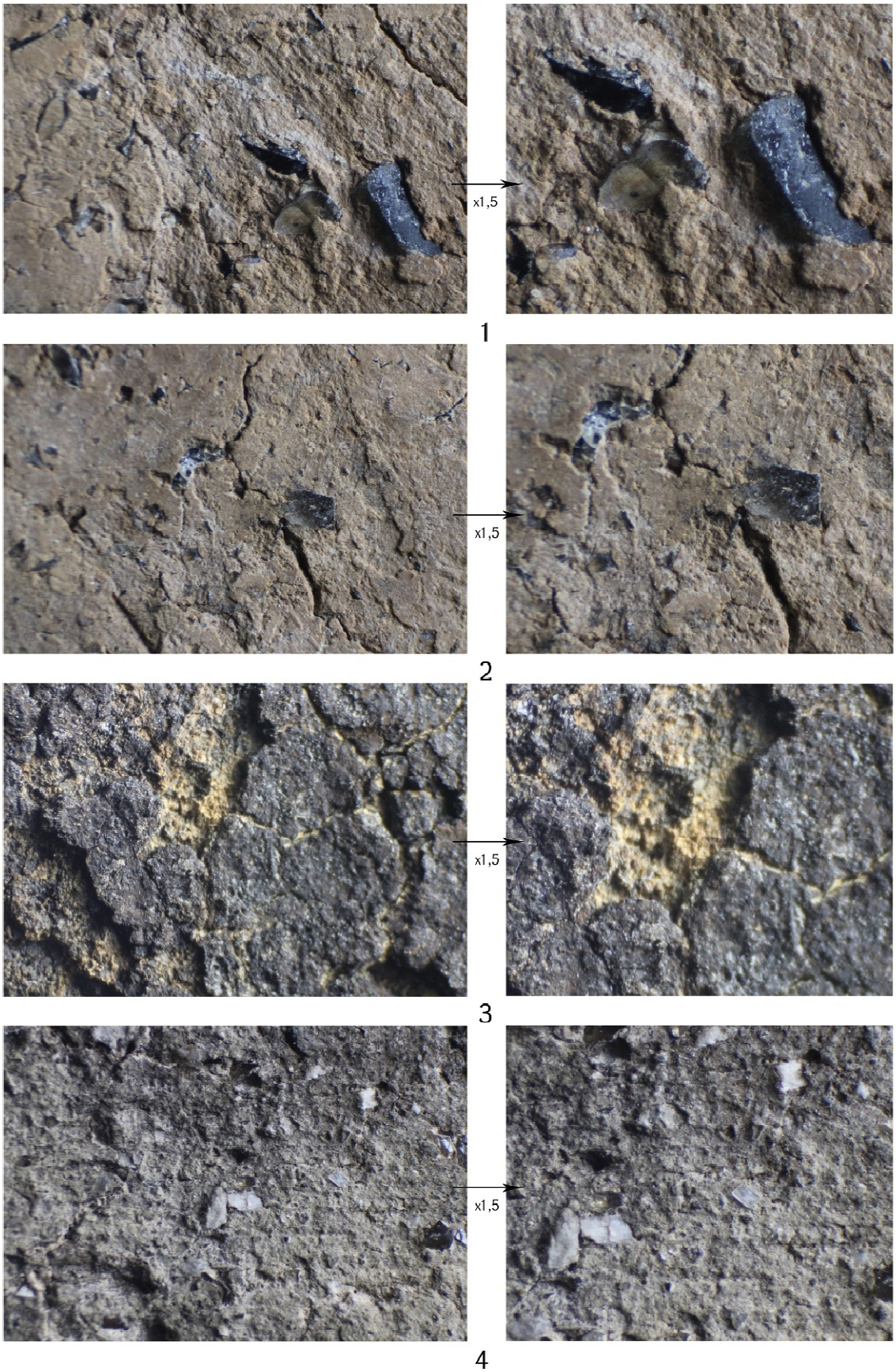
inner surfaces. The clay appears non-homogeneous, with a sheet-like structure and a well-fired core. A small amount of organic admixture is present, with some examples showing a predominance of chaff temper. While the external surfaces are coated and treated, the original shapes of the vessels remain indeterminate. As it is visible from the special table dedicate to the technologically interesting group of pottery sherds nine examples belongs to the horizon 1 and mostly to 1a (tab. 14 / 1-7, 11, 12 and pl. 9).

The presence of obsidian inclusions in the clay requires further in-depth study. Evidence from the cave supports the idea that the more intensive use of such tempers was a characteristic feature of the final period of the Sioni tradition at the end of the 5th millennium BC (Palumbi *et alii* 2018, p. 132). However, excavation data from Getahovit Cave also indicate that the tendency for this type of tempering, albeit with minor quantities of volcanic glass inclusions, originated much earlier and persisted throughout nearly the entire Chalcolithic period (pl. 10).

№	Exc. Year	Sq.	US	ST	Museum №	Part	Temper	Décor.	More	Plate
1	2012	D7	5			1 body	Grit		Obsidian in the paste and textile imprint probably	9/5
2	2015	F2, 3	21			4 bodies	Grit	Combed surface	Obsidian in the paste	9/2
3	2015	I, J, H - 5	8			3 bodies	Grit		Obsidian in the paste	
4	2015	C0	3			1 body	Grit		Obsidian in the paste	
5	2015	D2	3/30			3 bodies	Grit	Combed surface	Obsidian in the paste	
6	2015	G3		125		1 body	Grit		Obsidian in the paste	9/3
7	2015	D4	33			1 rim	Grit		With the finger squeeze	9/9
8	2021	A (-2), II hall			0017	1 body	Grit		Textile imprint on the internal surface	9/1
9	2023	A (-4), II hall				3 bodies	Grit		Has the finger compression traces on the internal face of the clay	9/10
10	2016	I5	41			1 body	Chaff and grit		Obsidian in the paste	9/6
11	2015	C4	30			1 body	Grit		Chaff imprints on the surface	9/7
12	2015	BC - 2,3		119		1 body	Grit		Chaff imprints on the surface	9/8

Tab. 14. The chalcolithic pottery with the technological and morphological particularities. Ceramica, calcolitică cu particularitățile tehnice și morfologice.

Pl. 9. Pottery with technological and morphological particularities: 1. A-2; 2. US 3-30; 3.St. 125; 4. US 30; 5. US 5; 6. US 41; 7. US 30; 8. St. 119; 9. US 33; 10. -A-4.
Ceramică cu particularități tehnice și morfologice: 1. A-2; 2. US 3-30; 3.St. 125; 4. US 30; 5. US 5; 6. US 41; 7. US 30; 8. St. 119; 9. US 33; 10. -A-4.



Pl. 10. Microscope photos of obsidian inside the temper.
Fotografii la microscop cu obsidianul din interiorul pastei.

Terrace

For this moment the trench done on the terrace part has no connections with the main trench inside the hall of the cave, so the stratigraphical interpretation and the similarities with the basic Chalcolithic layers accumulated at the first hall are a little difficult to do; besides, there are no ^{14}C dates from here. That is why the pottery found on the terrace, in our opinion, will be better to separate (tab. 15-17).

№	Exc. Year	Sq.	T - US	ST	Museum №	Part	Temper	Decoration	More	Plate	Total quantity of ceramics from the horizon
1	2017	G11	T4		0026	Rim			Yellowish	11/1	66 (2 chaff, 2 have grog)

T = abbreviation for *Terrace*

Tab. 15. Ceramics' qualitative and quantitative picture for Chalcolithic layer – horizon T1.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont T1.

№	Exc. Year	Sq.	T - US	ST	Museum №	Part	Temper	Decoration	More	Plate	Total quantity of ceramics from the horizon
1	2017	F11	T5		0035	Rim	Chaff in majority		Yellowish	11/3	75 (8 chaff, 1 has grog)
2	2017	F9, 11	T5-6		0028	Base	Grit ware, big pieces of stone inside		Orange colour	11/5	

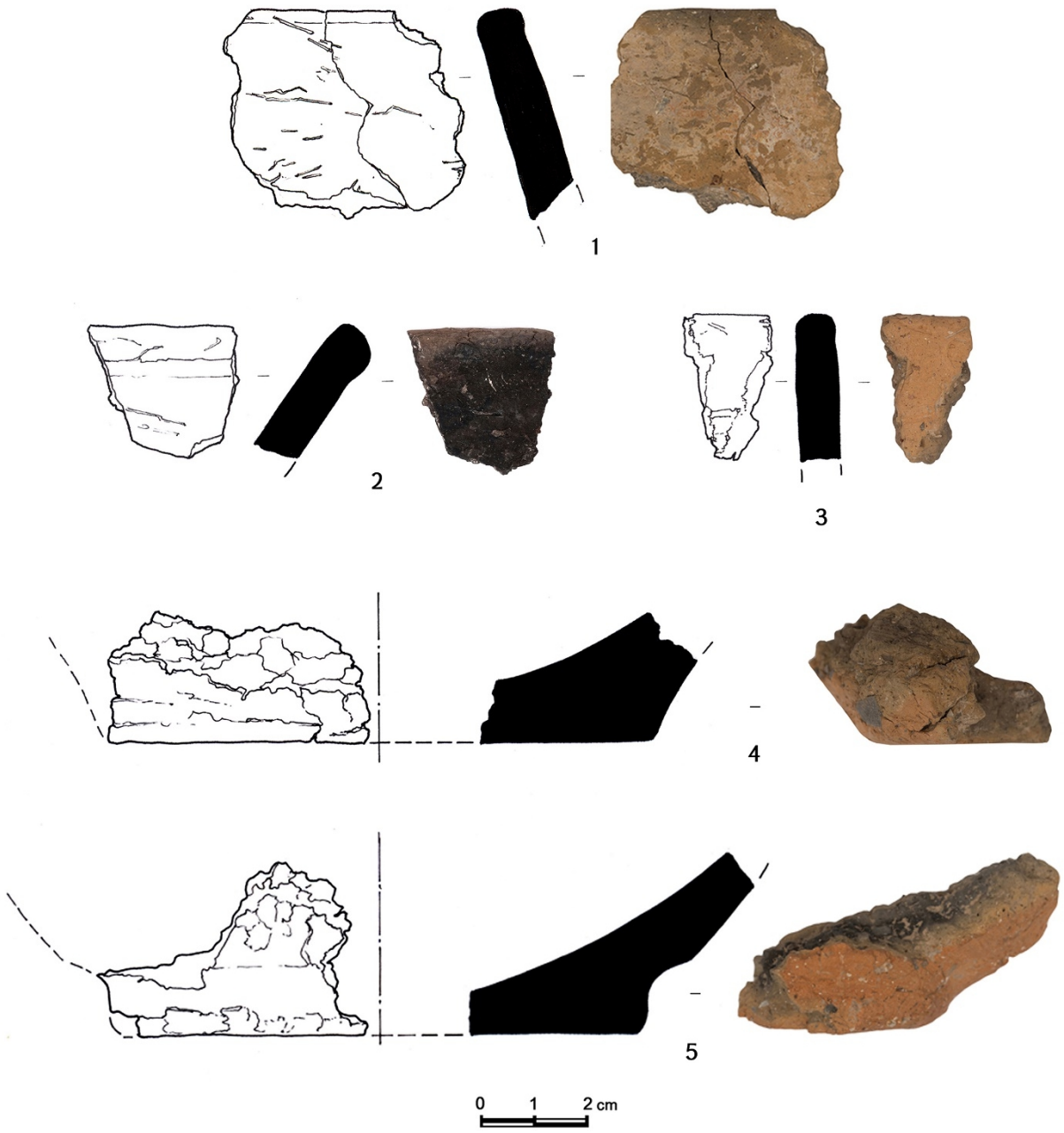
T = abbreviation for *Terrace*

Tab. 16. Ceramics' qualitative and quantitative picture for Chalcolithic layer – horizon T2.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont T2.

№	Exc. Year	Sq.	T - US	ST	Museum №	Part	Temper	Decoration	More	Plate	Total quantity of ceramics from the horizon
1	2017	F9	T6	4	0030	Rim	Grit		Burned	11/2	22 (3 have chaff and 2 have grog)
2	2017	F9	T6	4	0029	Base	Big pieces of stone, grit mostly			11/4	3

T = abbreviation for *Terrace*

Tab. 17. Ceramics' qualitative and quantitative picture for Chalcolithic layer – horizon T2.
Datele calitative și cantitative ale ceramicii pentru nivelul calcolitic – orizont T2.



Pl. 11. Pottery examples from terrace Chalcolithic horizons: 1. T-US 4; 2. T-US 3; 3. T-US 5, 4. T-US 6, St. 4; 5. T-US 5.
Exemple de ceramică din orizonturile calcolitice din terasă: 1. T-US 4; 2. T-US 3; 3. T-US 5, 4. T-US 6, St. 4; 5. T-US 5.

Nevertheless, we can calculate that from the stratigraphical point of view, the latest layers on the terrace (T US 4) must be equated to the latest horizon 1 inside the cave. As well as the T US 5 must be the same as US 5 or Horizon 2.

The stratigraphically later Chalcolithic horizon on the terrace contains distinct pottery types. Difficult to argue about; only we must stress the differences, such as the absence of polishing of the surfaces. The pottery, in general view, has a gritty matrix with a little organic, such as straw, which is visible mostly on the surfaces. The inorganic inclusions are too much

visible. The clay is composed of fine sand plus white, bigger pieces of sand and pieces of other kinds of stones of irregular shapes; obsidian can also be included. The surfaces are smoothed, but it seems they do not have any slips. Even the colours differ. Sometimes the scabrous surfaces we can observe. The bright yellow and orange have appeared. Some sherds contain more organic inclusions. Grog is also present in the list of inclusions. The pottery is highly fragmented, yet it exhibits some similarities to the assemblage recovered from the second space of the cave.

Important note: if the T US - es 4 and 5 mostly presented the unpolished pottery and without slips, the earlier one, US 6, has another look. The colours are moving to pale yellow, slip appears, and the surfaces are smoothed. Non-organic inclusions of the matrix are shiny sand, obsidian, and sometimes bigger pieces of irregularly shaped stones. Matrices are not porous; organic content increased in some cases (tab. 17, pl. 11).

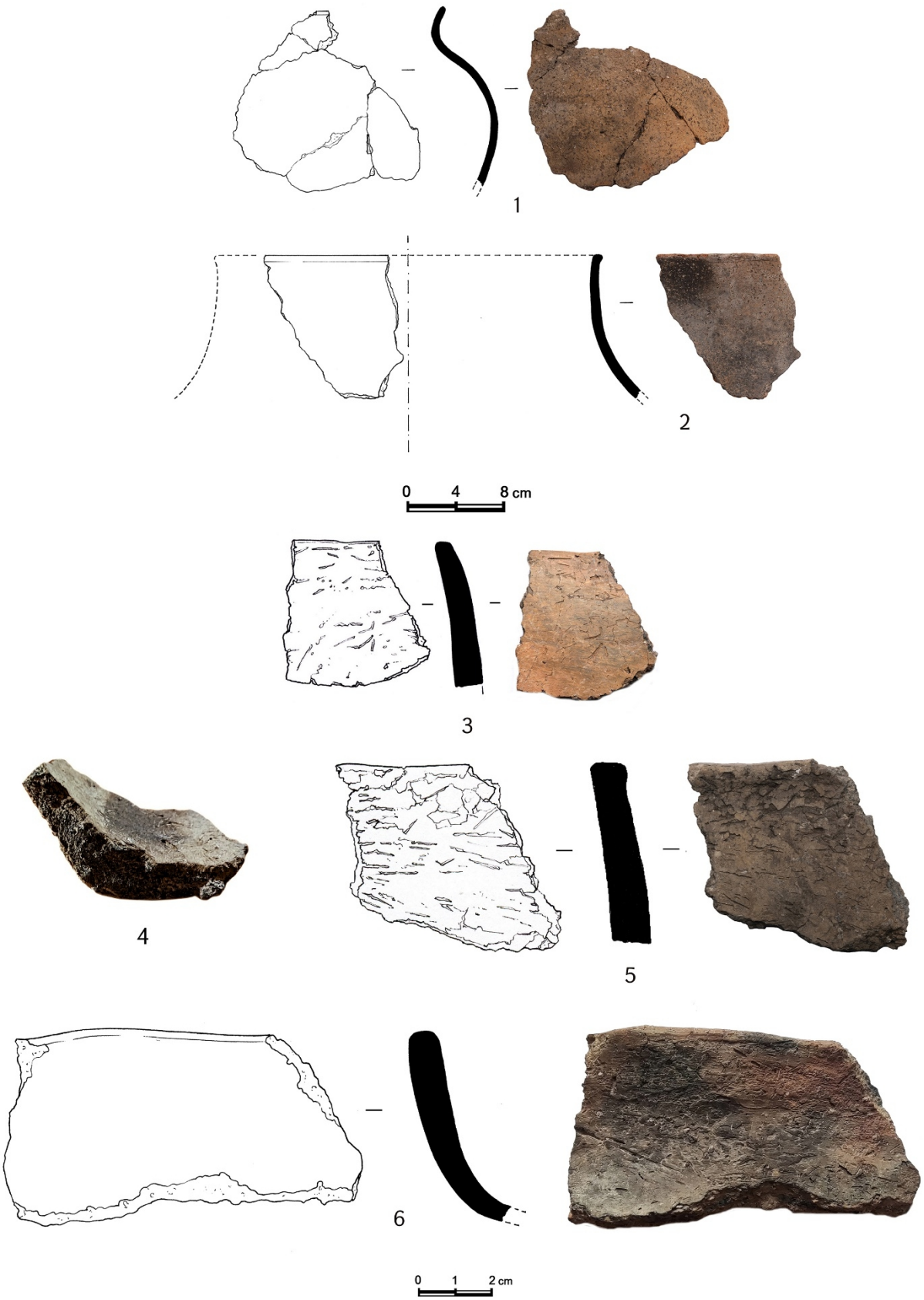
The second hall

The new data came from the 2020-2023 excavations, when pottery was found in the second hall that had not been noticed before. A new type was singled out, characterized by unpolished and scabrous surfaces. Nevertheless, smoothed and polished sherds were also encountered in the second hall (tab. 18). Shiny matrices were observed, sometimes generally gritty, and in other cases, the relative percentage of organic inclusions was more visible on the surfaces. Obsidian, along with grog, is present in the clay of some samples. The pottery predominantly displays a greyish-brown coloration (10YR 5/2).

№	Exc. Year	Square	US	ST	Museum №	Part	Temper	Decoration	More	Plate
1	2023	-A (-4)			001	Rim-body	Grit			12/1
2	2023	-A (-4)			002	Rim-body	Grit			12/2
3	2021	A (-2)			0015	Rim	Grit and chaff			12/6
4	2020	A (0)			003	Base	Chaff			12/4
5	2020	A (-1)			0010	Rim	Grit and chaff			12/7

Tab. 18. Ceramics' qualitative and quantitative evidence for Chalcolithic layer-horizon 1 (?) of the second hall.
Datele calitative și cantitative ale ceramicii din nivelul calcolitic – orizontul 1 (?) din sala a doua.

Most of it was found within the compact, likely muddy sediment that also covered the human remains of a young individual. The skeletal fragments were uncovered in various parts of the second hall, suggesting that the individual was not formally buried. No evidence of a burial structure or pit has been identified so far.



Pl. 12. Pottery examples from second hall: 1. A-4; 2. A-4; 3. A (-2); 4. A-1; 5. A-2; 6. A-1.
Ceramică din sala a doua: 1. A-4; 2. A-4; 3. A (-2); 4. A-1; 5. A-2; 6. A-1.

The parallels to some sherds are clearly visible at the Chalcolithic period site of Teghut, located on the Ararat Plain, which is recognized as a Late Chalcolithic period site. They repeat the type of grit matrix and the morphology of the site's pottery assemblage. For instance, pot 002 (pl. 12/1) has parallels with one presented in Table IV-8, while jar 001 (pl. 12/2) closely resembles an example in Table IV-2 (Torosyan 1976, tab. IV).

Two particularly noteworthy and informative finds related to pottery production were uncovered from here (tab. 19). One example (pl. 9/9) bears visible traces of the rim modelling process by using the finger squeeze. Even more remarkable is a sherd bearing a textile impression (pl. 9/1), comparable to similar examples found at the Teghut settlement on the Ararat Plain.

More analogies exist in the examples from Aknalich burial mounds, where this kind of pottery is interpreted into the First group. The description of the clay included the saturation of greyish obsidian debris that made the pottery both shiny and coarse, although both the inner and outer surfaces were smoothened with a comb-like tool. The external surface is also covered with a light greyish (7.5YR 6/3) slip (Muradyan *et alii* 2014, p. 343).

Two additional diagnostic pieces, illustrated in pl. 12, were recovered from the second hall. Some of the pottery from here is made of clay tempered predominantly with chaff (pl. 12/4-5).

Among the pottery recovered from the terrace, several examples share parameters very similar to those described above.

So, the pottery assemblage recovered from the second space of the cave, including layers disturbed by medieval activity and those transitional from the sterile layer (1a), as well as contexts marked as US 4/Trench 2, represents a distinct group. This group can be classified as the Sioni type (Group A), as defined by Kiguradze and Sagona (Kiguradze, Sagona 2004, p. 48).

The distinguishing features of this pottery are well represented across the assemblage. These include comb-treated surfaces (*e.g.*, US 21, US 3/30), the abundant presence of obsidian inclusions in the clay matrix (*e.g.*, US 8, US 21, US 3/30, second hall), and sidelong cuts on the rim (*e.g.*, US 8). Additionally, shiny surfaces, likely resulting from micaceous clay, are observable. Chaff-tempered clay also appears as a common variety within this group (Menadbe, Kiguradze 1981, p. 114).

Unfortunately, no clear traces of an undisturbed occupational horizon have been identified in the main hall of the cave. As discussed earlier, medieval occupation activities likely destroyed or obscured these contexts. However, more intact evidence appears to be preserved on the terrace, where further excavation over larger areas is necessary to clarify the occupational sequence. Likewise, the second hall remains a promising area that requires further detailed investigation.

The pottery discovered in the second hall (pl. 12), as well as that from the terrace area, currently lacks radiometric dating.

Several diagnostic Chalcolithic pottery fragments cannot be attributed to a specific horizon due to their recovery from contexts mixed by medieval disturbances. In contrast, some pieces, such as those with applied decorations (tab. 19/4-6), can be clearly assigned to distinct horizon assemblages.

№	Exc. Year	Square	US	ST	Museum №	Part	Temper	Decor	More	Plate
1	2015	BC3		119	0018	Rim body	Grit and chaff		It seems that it was dried on the chaff	13/5
2	2017	H5		146	0032	Rim	Grit and chaff			-
3	2017	H5		146	0031	Rim	Grit and chaff			-
4	2017	H5		146	0033	Rim	Grit and chaff	With the vertical ellipsoid		7/3
5	2015	E3		103	0062	Rim	Grit and chaff	With the vertical ellipsoid		7/2
6	2012		3c	14	0016	Rim	Grit and chaff	With the horizontal ellipsoid		5/3
7	2015	I3		121	0059	Rim	Grit and chaff			
8	2014	B6	6	64	0021	Rim body	Grit and chaff			13/1
9	2013	BC, 3	6	10	00	Rim	Grit and chaff			13/4
10	2012	D6	5		0015	Rim	Grit			13/3

Tab. 19. Ceramics' qualitative and quantitative picture for Chalcolithic period pottery find from the medieval layers and structures.
Datele calitative și cantitative ale ceramicii din nivelul calcolitic identificate în structurile și nivelurile medievale.

◈ The general description of the Chalcolithic pottery from the cave

The ceramic artifacts unearthed from the Getahovit-2 cave exhibit the characteristic repertoire of Chalcolithic pottery. Given that the cave served as a temporary stop rather than a permanent residence for mobile groups, practicality was a key consideration. That suggests that the heavy and oversized pottery was not practical for the mobile lifestyle of the groups using the cave as a temporary station. Perhaps this explains why the pottery discovered in the cave tends to be mid-sized or relatively large, with only a few examples. It is possible that the groups utilizing the cave came from various places, each bringing pottery reflective of their cultural traditions. This diverse mix of pottery styles found in the cave represents the different horizons and stages of the period, showcasing a range of styles specific to various time frames and regional characteristics.

The clay temper typically consists of grit with a low proportion of organic matter, whereas earlier examples include pottery made with clay containing a higher percentage of organics. Some assemblages, such as those from Horizons 2 and 1b, are relatively

homogeneous and composed almost exclusively of grit-tempered ware. In contrast, Horizons 7, 4, 3, and 1a exhibit greater variability. This pattern suggests that the site's ancient visitors originated from regions employing different clay preparation techniques.

The matrix in many cases includes obsidian, both in smaller and larger quantities. The presence of obsidian within the pottery raises intriguing questions. It is found both in gritty wares and in paste dominated by organic inclusions, suggesting its intentional incorporation during production.

The pottery was handcrafted, with vessels primarily small to medium in size. The larger pieces are typically cylindrical or vase-shaped, featuring solid, flat bases, occasionally with slightly protruding heels (pl. 13). The rims vary, ranging from simple straight edges to slightly curved designs. Handles are rare, with only two examples observed, both of which may also be considered decorative elements (pl. 1/1; 4/5). One is a lug, and the other is perforated.

Pl. 13. Principal pottery forms from the Chalcolithic layers of Getahovit-2.
Principalele forme ceramice din nivelurile calcolitice de la Getahovit-2.

Construction techniques include the use of clay coils and a method of composition around textile sacks. Notably, there are no mat imprints on the bases or elsewhere on the pots.

The colour palette of the pottery is not very diverse, mostly spanning shades of brownish and greyish, with occasional fragments showing hints of pale yellow. The treatments vary, with uneven firing observed across the pieces. Most of the items from the assemblage appear smoothed, although some rare examples differ. The burnished and well-burnished pieces feature slip-covered surfaces and are rarely polished. The morphological repertoire includes large open shallow bowls, hole-mouth open bowls, cups, jars with everted rims and short necks, and jarlets. Tray and mangal types are notably absent (Marro 2022, p. 117).

The decorative elements on the pottery from the Getahovit-2 cave are limited, often replicating popular styles of the period and occasionally reflecting a tendency to integrate functionality with ornamentation. Decorated vessels, absent from the earlier layers, appear only in the latest occupational phases. The decors feature vertical and horizontal knobs (ellipsoids), cornices beneath the rim, rim cuts, and combed surface treatments (Chataigner 1995, p. 87-129, pl. 14).

Clay consistence divisions

In general, the Chalcolithic period ceramic assemblage from the Getahovit-2 cave, based on clay consistency ratios, can be divided into two major groups: the first can be defined as "grit ware" where the grit prevails and the second – "chaff (straw)-tempered ware," where the organic admixture is predominant. The major group presents grit ware, comprising approximately 90% of the assemblage (fig. 5 and tab. 20).

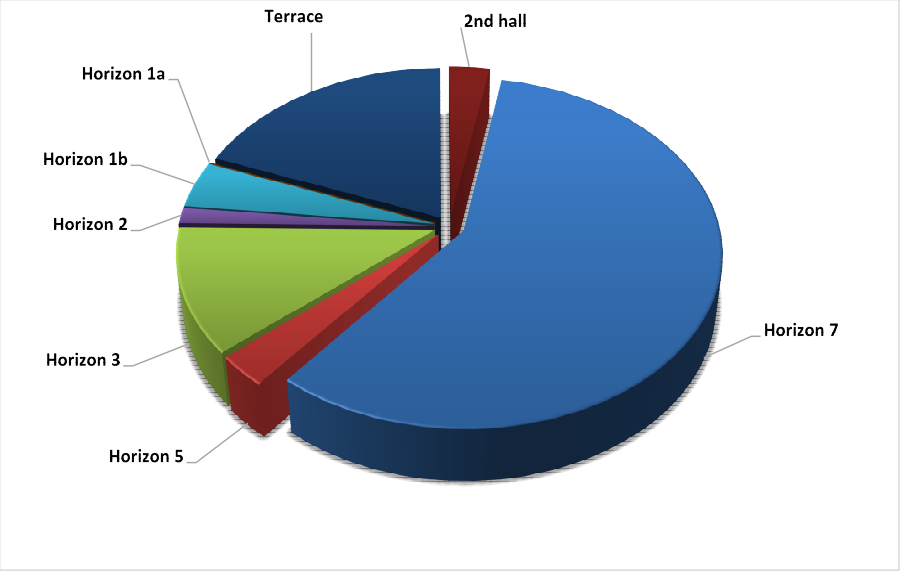


Fig. 5. Comparative analysis of chaff ware quantities across horizons.
Analiza comparativă a cantităților de ceramică cu pleavă între orizonturi.

Chaff tempered ware

The group, designated as the second technological category, primarily consists of pottery remains from Horizon 7, the earliest Chalcolithic layer at the Getahovit-2 cave. This group is characterized by clay matrices predominantly composed of chaff, with varying percentages of inorganic inclusions such as sand and other minerals. Admixtures of obsidian

are also common. In several cases, the porous texture of the clay indicates the burning of organic temper during the firing process.

Horizon	N sherds	N Chaff	% Chaff in the horizon	% Chaff out of total chaff
7	42	40	95%	58%
6	0	–	–	–
5	1	1	100%	3%
4	8	0	–	–
3	39	8	20,5%	12%
2	197	2	0,5%	1%
1b	154	3	2%	4%
1a	32	0	–	–
Terrace	163	13	8%	19%
2nd hall	35	2	3%	3%
Total	631	69	10,6%	100%

Tab. 20. Distribution of the Chaff-tempered ware by horizon.
Distribuția fragmentelor ceramice cu pleavă pe orizonturi.

As it was mentioned above, the chaff prevailed clay constructed pot with the vertical perforated handle (pl. 1/1) will be under the focus of additional discussion (Kalantaryan, Ghanem 2019, p. 13). A parallel of this kind of handle is known from the tableware found from a synchronic site Ginchi located in mountainous Dagestan (Gajiev 1991, p. 35-40). Other parallels can be stressed in the case of the Damtsvari Gora (Varazashvili 1992, p. 46), Nachivchavebi, near Tetritsqaro (Chikovani *et alii* 2010, pl. 1/5), Arukhlo VI (Hansen *et alii* 2007b, p. 11, abb. 26), Tsopi (Nebieridze 2010, pl. XXXIII, Chataigner 1995, p. 117, pl. 34) and Kul Tepe VII and VIA (Abedi *et alii* 2014, p. 94, fig. 14/8 and 28/17). By the inclusion composition and shape of the rim we can compare the type with those from Aratashen Level 0, where chaff-tempered ware is the most prominent type of ceramic production (Palumbi *et alii* 2014). The pottery sherds found from these early horizons had also parallels in the Chalcolithic layers from Mentesh (Lyonnet 2017, p. 143) a site in western Azerbaijan. The sherds from Getahovit placed well with the pottery separated into group 2 of phase 2 (phase 2 was still considered to belong to an early phase of the Chalcolithic period by the authors), dated to ca. 4800-4600 BC. The pottery is handmade, chaff-tempered, and can be also tempered with other vegetal elements (shaft), leaving rather long and/or large prints on the surface of the sherds. These are often covered with red slip and polished. Except for this slip, their external appearance makes them difficult to differentiate from other Chalcolithic pottery (Lyonnet *et alii* 2016, p. 179). Red slip is also known from Rabati (Chalcolithic period), south-west Georgia (Bedianashvili *et alii* 2019, p. 13, fig. 19/5-6), also from the EC layers of Kul Tepe (Hadishahr) site (Abedi *et alii* 2014, p. 38, figs. 9/9 and 10/10, Kul Tepe VIII). Good parallels can be evidenced from the south presented by site Uçan Ağil (Marro 2022, p. 120-122).

Two additional examples of straight, simple rims likely belong to small-sized vessels, such as bowls or cups, originating from the assemblage (pl. 1/2). Completing this group are two bases of similar shape with protruding, prominently stressed heels (pl. 1/3-4). Such bases are typical of early traditions and are comparable to examples from Imiris Gora (Horizon IX) and Shulaveris Gora (Chalcolithic period) (Masson *et alii* 1982, p. 150).

A single sherd, currently the only one identified from Horizon 5 in US 48, also belongs to this group (pl. 2). This sample demonstrates excellent firing, producing a compact clay matrix primarily composed of chaff, along with minor mineral inclusions.

A few sherds associated with Horizon 3, characterized by a chaff-dominated matrix, warrant further discussion. The pottery assemblage from Horizon 3 predominantly features grit-tempered ware, but in eight the clay exhibits significant chaff inclusions.

One rim sherd (pl. 4/3), likely part of the chaff-tempered ware group (Abedi *et alii* 2014, p. 110, figs. 9/9-10; Kul Tepe VIII, Bakhshaliev *et alii* 2024b, p. 11, fig. 3/7-8; Lyonnet *et alii* 2012, p. 38, fig. 42/1), may have belonged to an open-mouthed bowl or possibly a barrel-shaped pot. Its external surface is a creamy colour, specifically 7.5YR 7/2 (pinkish grey). This sherd stands apart from the rest of the assemblage, suggesting it might be an imported piece.

Another rim fragment, also creamy in colour (pl. 4/2; 10YR 7/3, very pale brown), features a flat-topped rim. It is composed of clay with significant chaff content and is attributed to a bowl form. Both rim fragments (pl. 4/2-3) likely belong to bowl types.

Two additional diagnostic fragments, along with several sherds featuring chaff-dominated matrices, were recovered from the latest layers of the second hall excavations (pl. 12/4-5). Here, the same pattern emerges: the pottery assemblage includes both chaff-tempered and grit-tempered ware, with the latter predominating. One notable example exhibits a damaged surface, revealing finely chopped organic material – likely chaff – embedded within the clay beneath a slip layer (pl. 9/6).

This chaff-tempered group is characterized by pottery where organic inclusions predominate, forming a distinct technological and morphological assemblage. It mostly represents an early sequence of the Chalcolithic period uncovered at the site (pl. 1) diagram 2 provide further context (fig. 5).

Grit ware group

The Grit Ware group is designated as the first, with clay consisting mostly of grit and varying percentages of chaff additions.

Grit-tempered pottery constitutes the majority of vessel fragments recovered from the cave. These fragments likely continue the pottery traditions of the Shulaveri-Shomutepe cultural range, reflecting their transition and adaptation into the Chalcolithic period.

In terms of morphology, the pottery group exhibits key attributes typical of Chalcolithic assemblages. The vessels primarily include barrel-shaped or hole-mouth jars of small to medium sizes, with a notable variety of vase-shaped examples. Additionally, low-necked jars are present, characterized by subtle transitions from the neck to the body. The rims predominantly merge seamlessly with the body, featuring simple straight-cut or tapering forms. Bowls are also common within the assemblage, though everted rims appear rarely – observed in only one instance (pl. 6/5). The bases are generally thick and flat, with transitions between the base and body often minimally emphasized (pl. 6/5, 7). Notably, some vessels exhibit protruding or heeled base types.

From a compositional perspective, the pottery matrix consists of a mixture of clay and sand, with varying amounts of inorganic and organic inclusions. The inorganic components include mineral inclusions of varying sizes – ranging from a few millimetres to a centimetre – and crushed obsidian. In some cases, the matrix is well-processed and homogeneous, despite the visibility of the inorganic inclusions. By contrast, other examples display porous and somewhat burnt surfaces, suggesting variations in production techniques or firing conditions.

Organic inclusions, though present, appear in small and inconsistent quantities across the assemblage.

The methods of surface treatment observed in the Chalcolithic layers of the Getahovit-2 cave are diverse. The full spectrum of techniques is represented, including simple smoothing of surfaces and the application of a thin layer of liquid clay slip. Examples of vessels without any surface smoothing are also present. The firing of the vessels appears to vary; while some were fired evenly and thoroughly, others exhibit irregular firing patterns.

The pottery was handmade, employing construction techniques such as building with clay bands or slabs arranged around a supporting form, possibly a textile sack filled with bulk material. Evidence supporting this hypothesis comes from a notable fragment recovered at Getahovit-2, where a textile imprint has been preserved on the vessel's inner surface (pl. 9/1). Parallels for this technique are found at Tsopi (Nebieridze 2010, p. 9, pl. XXIII), the Teghut settlement (Torosyan 1972, p. 97-99), at the Tsakhkunq site (Vagharshapat Historical-Ethnographical Museum collection, artifacts: 1323, 1324, 1325, 1328, 1330, 2054, and 2101), Tsakgkalanj (Torosyan 1972, p. 97), Grmakhevistavi (Abramishvili *et alii* 1980, tab. III/112) and Treli. In some cases, an imprint appears between the two layers of clay such as at Didube and Khizanaat Gora, or Amiranis Gora (Kiguradze, Sagona 2004, p. 48).

One particularly well-preserved example reveals the pot construction method through clear technological traces**.** This vessel appears to have been modelled manually, as evidenced by visible finger imprints on the internal surface of its thin-walled body (pl. 9/10). On several other sherds, technological details are equally discernible, including a three-part logic in vessel construction and the practice of covering contact joints with thin layers of clay.

Regarding the bases of vessels from Getahovit-2, no traces of mat imprints have been identified.

As previously discussed, grit-tempered pottery can be subdivided into distinct subgroups based on the type and consistency of the clay matrices. Four major subgroups have been identified. When addressing these classifications, it is advisable to consider the relative chronological sequence, ranging from earlier to later phases.

Subgroup 1

This group is characterized by slightly porous, grit-tempered clay fabrics. Many of the vessels are tempered with minerals up to half a centimetre in size, and the organic content exceeds 10 percent. In some instances, whitish mineral inclusions are present, while in others, darker-coloured minerals dominate. Occasionally, obsidian particles can be found within the clay. The surface treatment is well-executed, with the pottery being smoothed and, in most cases, covered with slips. Morphologically, this group shows a continuation of earlier pottery traditions, alongside the emergence of potentially new forms. Barrel-shaped vessels are predominant (Bastert-Lamprichs 2017, p. 239-240; Tonetto 2019; Kushnareva, Chubinishvili 1970, tab. 11/1, 4). The transitions from the base to the body are particularly pronounced, and protruding base types remain common. However, new shapes, such as vase-type forms, begin to appear, especially in the form of base fragments. These shapes were also popular during the Neolithic period, as seen in pots from Aruchlo (Hansen *et alii* 2013, p. 393). The pottery is notably lacking in decoration, though a horizontal lug is present on a large barrel-shaped pot (Hansen *et alii* 2007b, p. 11; Bastert-Lamprichs 2017, p. 240, Abb. 6/1). As mentioned earlier, two base fragments from relatively large vase-shaped pots are also included in this group (pl. 4/5; 5/1, 4; 6/1-2, 4; 13/5). In general, the pottery comes from horizons 3, and 2. This subgroup

shares many similarities with the third subgroup, suggesting a strong continuity in pottery traditions across these horizons.

The barrel-shaped or cylindrical vessel (pl. 4/5) has analogies at Kyul Tepe in Nakhijevan (Kushnareva, Chubinishvili 1970, p. 38, fig. 11/2, 4; Bakhshaliev 2016, fig. 1; Bakhshaliev 2019, p. 101, fig. 4). This vessel type also bears a resemblance to the later horizons of Imiris Gora (V Horizon, third stage), where three ceramic groups are differentiated, similar jars with barrel or oval-shaped bodies are categorized in the third group (Masson *et alii* 1982, p. 112, tab. XXXVI-5; Kiguradze 1976, p. 162).

The horizontally applied lug on this vessel finds parallels at the Neolithic sites of Aruchlo (Hansen *et alii* 2007b, p. 9-11, Abb. 25; Bastert-Lamprichs 2017, p. 238, 240, Abb. 6/1). as well as very well-known from Aratashen (Arutyunyan 2008; Harutyunyan 2014, p. 192, fig. 1). Additional examples have been observed at Kamiltepe (Lyonnet *et alii* 2012, p. 38-43). Similar lugs have also been reported from the Tsiteli Gorebi 5 archaeological site in Georgia (Tonetto 2019, fig. 14). Another Georgian site, Damtsvari Gora, features cylindrical vessels with a single horizontal lug applied to the body (Varazashvili 1992, p. 44, tab. XXIV/2).

This example eloquently demonstrates the enduring legacy of Neolithic traditions.

The one from Getahovit is particularly notable due to its sandy texture and precise radiocarbon dating.

Small vessels with external cornices under the rim (pl. 6/1-2) are also of interest. Based on the matrix type, these belong to subgroup 1. The sand is shiny, with large mineral inclusions, and the mixture includes grog. Similar examples have been found at Kyul Tepe I in Nakhijevan (Masson *et alii* 1982, p. 155, tab. XLIII/22; Marro *et alii* 2019, fig. 15/4).

Subgroup 2

This subgroup primarily consists of pottery with a non-homogeneous, porous clay matrix, where the inclusions – except for sand – are either not clearly visible or absent, and the core appears burnt. The matrix itself is flaky. Organic inclusions are minimal or entirely absent. Notably, the surfaces are well-treated, coated with slips, and burnished. However, the slipped surfaces often show cracks due to the burnishing process.

Some vessels, identified by their rims (pl. 5/2-3; 8/1, 5-6), share similar clay composition and treatment methods, confirming their inclusion in this group.

Regarding decorations, small horizontally applied lugs (or bulbs) are a common feature. One example (pl. 5/2-3) shows a small cup with a row of horizontally applied lugs just below the rim, which is particularly notable. This type of decoration likely indicates a widespread usage of these ceramics, which can be associated with table ware.

All of these ceramic types originated from roughly the same stratigraphical layer – horizon 2 – except for a few examples that appear in the later horizon 1b-1a. The most notable example is a large pot with an everted rim and flat top, found in a pit (pl. 5/5). Only the upper half of the vessel was recoverable.

One sample must clarify the inclusions for this subgroup:

- Getahovit-2 2016, the rim fragment from the horizon 2, US 36 H4 0037.

The scraped black material is composed mainly of clay-bound iron hydroxide (limonite) – 9%, phytoliths – 2%, plant remains – about 2%, which has burned traces, weathered volcanic glass – 5% (probably belonging to fragments of volcanic rock visible in the pottery) and carbonate material – 1%.

Subgroup 3

The pottery subgroup discussed here is distinguished by its unique clay matrix. The clay exhibits a homogeneous, compact consistency, often containing fine, sometimes shiny sand. Inclusions typically include whitish small particles, occasional larger stone fragments measuring a few millimetres, and a small percentage of organic material.

This subgroup primarily comprises kitchenware, characterized by uneven and irregular firing that results in varying colour shades across different parts of the vessels. The predominant colour spectrum includes red, yellow, and grey tones (7.5YR - 5YR). Morphologically, the group consists of medium-sized pots (jars) with flat bases and vase-like shapes, where the upper sections curve slightly inward. Notably, the clay often incorporates white sand, with relatively large mineral grains visible among the fine sand. The inclusion of white sand in the clay mixture is a defining feature of nearly all vessels in this subgroup.

The surface treatments of these vessels vary. In some examples (pl. 6/4, 7), the surfaces are simply smoothed and appear matte. In other cases (pl. 6/5), the exterior surfaces are treated with a specialized slip, resulting in a well-finished appearance. Rims (pl. 6/6) often exhibit more refined smoothing, with both the interior and exterior surfaces coated with a specific clay slip. The construction of these vessels follows a tripartite logic, evident from their breakage patterns. All pieces are handmade using clay bands or slabs. Transitions from the base to the body are subtle and cohesive (pl. 6/5, 7), achieved by applying a thin layer of clay and slip decoration to unify the sections (pl. 7/4).

One notable vessel (pl. 7/4) demonstrates this technique clearly. A thin clay layer, containing fine, shiny sand was applied to cover the joints at the base-to-body transition, giving the surface a slight sheen. The vessel was fired in an uneven oxidizing-reducing atmosphere, with mineral inclusions such as whitish particles and impressions of large straw stems. Despite its fragmented condition, the morphology is clear: a vase-like shape with a slightly convex body and an inward-curving rim. Relief decorations, including ellipsoids or knobs, start immediately below the rim.

Similar relief motifs, while rare at later sites like Teghut, Leilatepe or Boyük Kesik, are well-documented in the Late Chalcolithic II horizon (4000–3800 cal BC) at Areni-1 cave. These motifs also adorned jars, pithoi, bowls, and cauldrons (Zardaryan 2014, p. 209) and have been found in the Tsutskhvati cave complex (Tskvitinidze *et alii* 2020, p. 129). The closest parallel to the Getahovit pot comes from Shulaveris Gora, Georgia (Masson *et alii* 1982, p. 111, tab. XXXI-4). Comparable examples with vertical bulb (ellipsoids) decorations have been identified at Amiranis Gora, Imiris Gora, and Kviriastskali (Masson *et alii* 1982, p. 150, tab. XXXVIII-25; Varazashvili 1992, p. 21) as well as sites in Kvemo-Kartli.

In Armenia, similar decorated sherds have been uncovered at sites such as Kghziak Blur, Shengavit (Sardaryan 1967, p. 138; Sardaryan 2004, pl. XXVIII), Shomutepe (Akhundov 2013, p. 57, tab. 156/1, 209, 210), and Aknashen, where mineral-tempered pottery with ellipsoid decoration was discovered (Harutyunyan 2022, p. 87). Aruchlo (Lyonnet *et alii* 2012, p. 78-79, fig. 110) also yields relevant comparisons.

Three sherds with similar decoration were found in the Getahovit-2 cave. These fragments feature vertically attached ellipsoids starting from the rim, including one from an open-mouth bowl with a slightly outward-curving rim (pl. 7/1). All vessels in this group represent simple kitchenware. Another example of a similar shape (pl. 7/3) differs primarily in its lighter colour.

The base fragment from the assemblage (pl. 6/7) has an exterior colour of 5YR 5/3, with smoothing applied vertically, resulting in faint, shiny lines. A comparable vessel (pl. 6/5)

mirrors the morphology and smoothing technique of the first example, with a slightly different coloration (7/5YR 6/4, light brown). This vessel, however, features a slip coating on the external surface. Similar forms are well-documented at Kviriastskali (Varazashvili 1992, p. 30, tabs. XXV, XXVI). Its base is flat, and the transition between the body and the base is seamless.

The rim (pl. 6/6) adds to the group with its homogeneous clay matrix, which includes visible large inclusions. The colour is a light yellow with pink spots. In both of these examples, the technological features are clearly evident. Both vessels were constructed using the coiling (clay band) technique.

The clay matrix of this vessel contains large grains of white and grey minerals. It is a kitchen ware, with both its interior and exterior lightly covered in slip. The outer surface bears impressions of grass or, more likely, straw, likely caused by placing the wet-slipped vessel on grass to dry. However, due to either burning or uneven firing, the inner surface failed to retain its slip layer, leaving large inorganic inclusions exposed. The organic content in the clay is estimated at 10-12 percent. A similar impression, potentially decorative, appears on the exterior of another vessel (pl. 6/7), created either by placing it on grass or deliberately using such impressions as a motif.

It will be interesting to include the three of mineralogical analyses here to clarify the inclusions' origins.

- Getahovit-2 2013. The rim sherd from the horizon 1b – G 3, St 24, (004) (pl. 6/6).

The analysis of the sample reveals a mixture of carbonate (60%), clay, and iron hydroxides (limonite) at 40%. Additionally, small quantities of quartz and minerals are present. Such combination of materials could suggest the use of local clay sources, influenced by geological deposits in the region.

The presence of limonite and ferrous particles also suggests exposure to iron-rich environments, either from the clay sources themselves or possibly from the firing process if certain atmospheric conditions were present. The low amount of quartz could imply the intentional selection of finer clays, or it might reflect natural impurities in the clay sources.

- Getahovit-2 2013. The base fragment from the horizon 1b. BC 3, 4 St 37.

The scraped material is mainly composed of carbonate particles (carbonate grains are visible, white in colour), sometimes up to 2-4 mm in diameter. Carbonate sometimes has a yellowish tint. Few phytoliths, plant stems are found as well. The yellowish tint in carbonate could be due to slight iron oxidation or impurities within the carbonate itself, which could result from the environmental conditions of the source area or the firing process.

The inclusion of phytoliths and plant stems points to an organic component within the clay, likely from plant matter either naturally present in the clay source or deliberately added as temper. These plant inclusions would have burned off during firing, leaving impressions or voids in the ceramic matrix, which could impact the texture, strength, and porosity of the final pottery.

In combination, these observations suggest a complex interaction of both geological and environmental factors in the raw materials used for the pottery. The presence of large carbonate grains, iron impurities, and organic matter may influence not only the physical properties of the pottery but also its potential uses and the firing techniques employed.

- Getahovit-2, 2014. The base fragment from the horizon 1b, B 4, 5 (0022) (pl. 6/7)

Mostly weathered grains about 90% (clay), there are also hydroxide iron minerals – 5%, plants – 2%, phytoliths – 1%, diatoms – 1%

Plants (2%) and phytoliths (1%) in the composition are organic inclusions that point to the natural vegetation or plant material incorporated during the clay's formation or

deliberately added as temper. As in previous observations, these organic inclusions would burn off during firing, potentially affecting the porosity or strength of the final pottery.

This subgroup of pottery primarily originates from a single context (Structure 37, excavated in 2013) and stratigraphically corresponding areas. This context points to a shared production site, consistent clay mixture, stylistic preferences, and similar technological practices (fig. 6).

A recurring characteristic of this subgroup is the variation in the clay matrix across different sections of the vessels. The lower, middle, and upper parts often display distinct compositions. Some areas consist of a homogeneous, dense mass, while others have a higher proportion of inclusions, giving the clay a more porous or "fluffier" texture. This suggests that potters intentionally prepared different mixtures tailored to the functional needs of specific parts of the vessel.

In summary, this subgroup represents a cohesive pottery complex associated with Horizon 1b, reflecting shared technological and stylistic traditions of the later Chalcolithic period. Overall, Chalcolithic pottery demonstrates high-quality craftsmanship, with some decorative elements, such as vertical bulbs, preserving long-standing traditions that trace their origins to Neolithic styles.

Fig. 6. Structure 37 presenting rich collection of pottery (photo from Getahovit expedition archives).
Structura 37 prezintă un inventar bogat în ceramică (foto din arhivele expediției Getahovit).

Subgroup 4

The clay matrix is homogeneous and grit-tempered, with obsidian being a prominent inclusion among the other particles (Muradyan *et alii* 2014, p. 343). Most of the surfaces are not smoothed and lack slips, giving them a grainy, gritty texture to the touch. However, there are also examples of slip-covered types present. On some pieces, particles of a few millimetres in size are clearly visible on the surface, along with traces of vegetal remains. Morphologically, the distinct shapes associated with the so-called "Sioni" ware and Teghut types are evident (pl. 8/2; 9/1-5, 7-10; 12/1-3, 6-7).

Summing up, Sioni ware at the site is characterized by its distinctive attributes, including quartz and crushed-obsidian-tempered gritty clay, combed surfaces, and rare side-long cut decorations on the rim. These artifacts originate from the latest Chalcolithic layers in the cave, though these layers have been significantly disrupted by medieval occupations. The dates attributed to these contexts correspond to the final centuries of the 5th millennium BC.

◈ Discussion

The prehistory of Transcaucasia remains problematic and presents several dilemmas, with the Chalcolithic period being no exception.

In a broad conceptual framework, the Chalcolithic period in the South Caucasus is divided into two phases: an early phase (ca. 5000/4800-4000 BC) and a late phase (4000-3500 BC). Archaeologically, this period is distinguished by two cultural traditions that are best known through their ceramics: the Chaff-faced ware tradition and the Sioni horizons. The Chaff ware tradition appears to have originated in the Syro-Mesopotamian plains and extended its influence to the mid-Araxes Valley and north-west Iran, notably the Urmia Lake region (Sagona 2018, p. 183; Marro 2007). In contrast, while the Sioni tradition was predominantly local to Kvemo Kartli, it is also attested on both sides of the Araxes Valley (Sagona 2014, p. 28). The Chaff ware tradition emerged as the dominant cultural expression during the 4th millennium BC, whereas the Sioni ware persisted from the beginning of the 5th millennium until the middle of the 4th millennium BC. Notably, these two traditions were contemporary only during the 4th millennium, specifically in the later phase of the Sioni complex.

In academic discourse, the established terms "Grit Ware" and "Chaff Ware" have traditionally been employed to classify pottery types. The ceramic assemblage at Getahovit-2 not only features classical examples of Grit Ware but also exhibits a range of compositional variations. Notably, as discussed earlier, the cave lacks examples of Chaff Ware in its classical sense and characteristics. Some specimens are characterized by a clay matrix with a high proportion of chaff inclusions, whereas others contain only trace amounts of chaff alongside variable grit fractions. One potential solution is to adopt a classification system based on the predominant inclusions, thereby providing a more nuanced framework that more accurately reflects the material composition of the assemblage while avoiding oversimplification.

The analytic view based on statistics, morphological visual analysis, and divisions based on it, as well as the comparative and comprehensive discussions of materials enable to make some important inferences concerning the Chalcolithic period realities and the cultural traditions.

From the first half of the 5th millennium BC, particularly between 5600-5400 cal BC, distinct communal groups were actively present in the Getahovit cave (Horizon 7). The pottery associated with these groups was primarily composed of clay with a high concentration of organic inclusions and, in some cases, exhibited characteristics reminiscent of Neolithic traditions. These features distinguish them from later cultural groups that emerged in the second half of the 5th millennium BC with a different pottery tradition. For example, some pieces feature red slips, a characteristic commonly associated with the Mentesh Neolithic (Lyonnet *et alii* 2016, p. 179), indicating that the influence of Neolithic pottery traditions persisted for an extended period. More broadly, this period bears imprints of the Shulaveri-Shomutepe Culture.

Even the bone tool types started to change their functional and morphological interfaces.

Such a situation is documented at the Nakhijevan site Uçan Ağil, where the piece of EC demonstrates the absolute distinction of pottery in the cases of morphology and technology from the later phases (Marro 2022, p. 118, 120-122). New data came from the site Nakhchivan Tepe (Kulieva, Bakhshaliev 2018; Marro 2022, p. 124) where both the early and middle phases of Chalcolithic are present, doing this site is contemporary to Getahovit.

A hiatus occurred between the events of the early and middle sequences of the Chalcolithic period (Horizon 6-5), lasting approximately one century. The subsequent period (Horizon 3-4) exhibits more intensive evidence of animal husbandry, while the pottery assemblage comprises a mix of grit- and chaff-tempered examples. This ceramic tradition is characteristic of the early phase of the Sioni complex, as exemplified by Mentesh Phase II (4775-4503 cal BC) (Lyonnet 2018a, p. 554). Notably, grit-tempered pottery began to predominate. An important observation is the absence of mangals or pans, which are typically found in the Mentesh layers (Lyonnet 2018a, p. 554).

The communities that occupied the cave for a longer period (Horizon 2) exhibit a different cultural variation, more closely associated with what is commonly referred to as the Sioni cultural sphere. The pottery temper becomes gritty. This is characteristic of the middle phase of the Sioni complex, as shown by the example of Mentesh III period (4360-4129 cal BC) (Lyonnet 2018a, p. 558). Although the dates correspond with Mentesh Tepe Period III, the pottery assemblage described here more closely corresponds with the later horizon at Getahovit Cave (Horizon 1a). Thus, we may conclude that the pottery from Horizon 2, as well as from Horizon 1b, is absent from the Mentesh III ceramic group.

The ceramics tradition observed at the cave reveals that decorative elements like ellipsoids (knobs), prominent during the Shulaveri Shomutepe Culture (Hansen *et alii* 2007a, p. 18), reappeared in the late stages of the Middle Chalcolithic period.

The population that occupied the cave for a relatively long period was highly active, engaging in various economic activities. At the very end of the 5th millennium BC, clear traces of the latest stage of the Sioni culture became evident, including ceramics with sidelong cuts on the rim and numerous obsidian inclusions in the clay. The surfaces of these vessels were treated with combing. At the same time, pottery types with technological similarities to those found at the Teghut site have also come to light. The obsidian in various proportions is present inside the temper in nearly every horizon. The pottery found from the early stages also has the debris of obsidian inside the chaff mixtures.

When examining the pottery types uncovered in the second space of the cave, it is noteworthy that these types have not previously been identified within the Chalcolithic layers of the cave. However, this type of pottery is well-documented at the Teghut site,

where Chalcolithic pottery is categorized into three groups: Grit Ware, Chaff Ware, and pottery made from pure clay – the latter being relatively rare.

The Grit Ware (or grit-and-chaff ware) from Teghut is handmade and primarily consists of simple kitchenware distinguished by uneven surfaces. The pottery is wet-polished or slip-covered, though the burnishing is inconsistent, resulting in noticeable colour variations. Some examples display a crimpy texture in the clay matrix. The pottery repertoire predominantly includes pots of various sizes and functions, which can be classified into three distinct groups: large, medium, and small.

Among the large pots, particular attention is drawn to those crafted from gritty clay, with outer surfaces entirely coated in tactile sand particles (Torosyan 1976, p. 73-74, fig. 13). These pots show no traces of fire, suggesting their primary function as food storage containers. Their rounded bases imply placement in specific supports or dug-out pits; however, no evidence of such pits was uncovered during the excavation of the lodging areas (Torosyan 1976, p. 74, Bakhshaliev *et alii* 2024a, p. 65). The medium-sized pots are characterized by a thin slip covering on both sides, with sand grains visible beneath the slip. Some examples also exhibit combed surface treatment (Torosyan 1976, p. 78), which bears similarities to pottery from sites such as Tsakhkunq, the late layers of Verin Khatunarkh-Aknashen, and Tapalar.

The pottery tradition at Teghut is notably distinct from that of other contemporary Chalcolithic sites, marked by the absence of flat bases and the rarity presented in general rim forms. However, comparable pottery types to those documented at Teghut have also been identified at the site of Tsakgkalanj (Torosyan 1976, p. 76). This detailed description serves to create the concluding remarks regarding the pottery from the late phases of Getahovit. It suggests that the second chamber of the cave was utilized by community members who brought with them pottery resembling the Teghut type. This assemblage includes both grit and chaff-tempered ceramic types, occasionally containing obsidian inclusions, though these are less abundant if compared to the Sioni examples.

The pottery exhibits a range of treatments, including polished and slip-covered surfaces, as well as completely untreated surfaces. These characteristics align with Torosyan's description of the Grit Ware pottery group, particularly the storage pots distinguished by their coarse, sandy outer surfaces – a feature previously undocumented at the cave. One more notable feature from here observed in the pottery is the presence of finger imprints on the clay surfaces (pl. 9/10), indicating specific construction techniques employed by the artisans (Bakhshaliev *et alii* 2024a, p. 65).

Notably, typical late Sioni site attributes found in the later layers – such as rim cuts, combed surface treatments, and obsidian inclusions in the clay matrices – are absent from the second hall and the late terrace. This absence raises important questions about the cultural attributions of these pottery groups and whether they were truly synchronous or represented distinct traditions. Also, important to mark the relatively low quantity of such kind of typical attribute of Sioni as cut marks on the pots' rims. There is only one from Getahovit. It makes the parallels with Tumbul tepe (Bakhshaliev *et alii* 2024a, p. 74).

The absence of precise dates for Teghut and Sioni pottery presents challenges in fully resolving their chronological framework, though their late origins can be reasonably argued (Bakhshaliev *et alii* 2024a, p. 76). A stratigraphic - comparative analysis of the late layers at the Getahovit-2 cave, supported by its established late dates (tab. 1), further substantiates this perspective.

◈ Conclusions

The elaborated and long-lasting investigations at the archaeological site of Getahovit-2 are providing valuable insights into the prehistoric periods, particularly the Chalcolithic era, which remains understudied, especially in the context of caves, not only in Armenia but also in the broader South Caucasian region. Despite their brief sojourns within the cave, people left behind cultural remnants such as tools crafted from obsidian, flint, and bone, along with ceramics, which serve as crucial markers of cultural traditions and attribution.

The archaeological discoveries at Getahovit-2 reveal pottery types characteristic of the Chalcolithic period, as well as tools that shed light on the daily activities of its ancient occupants. Notably, the preserved layers of coprolite within the cave provide a rare opportunity to investigate the behaviours and of mobile pastoralist, hunter, and gatherer societies who periodically utilized the site during seasonal migrations with their livestock, traversing between valleys and high pastures. Getahovit-2 represents a unique site documenting the transition from the Late Neolithic to the earliest Chalcolithic, as well as a continuous sequence of occupations from the early to middle Chalcolithic periods.

The systematic large-scale excavations, complemented by a series of radiocarbon dates, enable the detailed classification of pottery assemblages and the chronological mapping of their distribution. This approach provides critical insights into the cultural attributions and developments of the period.

Getahovit-2 reveals the centuries-long progress of the Chalcolithic pottery tradition within the region. The cave appears to have served as a convergence point for groups from various locations, each contributing their unique characteristics and attributions, enriching the archaeological narrative of the South Caucasus during this era.

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There is no smoke without fire. Analysis and interpretation of fire destruction episodes and abandonments in Early and Middle Cypriot settlements

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Abstract: *This paper examines fire destruction episodes in Early and Middle Bronze Age settlements on Cyprus (ca. 2250–1650 BCE). Traces of fire destruction are recorded in the stratigraphy of units or areas of all the main published sites known for these periods namely: Sotira* Kaminoudhia*, Marki* Alonia*, Ambelikou* Aletri*, Alambra* Mouttes *and Erimi* Laonin tou Porakou*. The goal is to understand and interpret these events and evaluate their possible implications in relation to the partial or final abandonment of these sites. The approach adopted is material-oriented and stems from the analysis of artefact assemblages in tandem with the contexts and stratigraphy of all the fire destruction episodes identified to reconstruct the relation between the characteristics of the artefacts – conditions, location, and preservation – and the type of abandonment – rapid/gradual, unplanned/planned – of the whole settlement or parts of it. A re-assessment of the assemblages in units affected by fire destruction allows us to shed some light on the occurrence and the nature of these events.*

Rezumat: *Aceast articol examinează episoadele de distrugere prin incendiu din așezările de Epoca Bronzului timpurie și mijlocie din Cipru (cca 2250–1650 î.Hr.). Urmele de distrugere prin incendiu sunt înregistrate în unitățile stratigrafice sau suprafețele tuturor principalelor situri cunoscute publicate pentru aceste perioadeși anume: Sotira* Kaminoudhia*, Marki* Alonia*, Ambelikou* Aletri*, Alambra* Mouttes *și Erimi* Laonin tou Porakou*. Scopul este de a înțelege și interpreta aceste evenimente și de a evalua posibilele lor implicații în legătură cu abandonarea parțială sau definitivă a acestor situri. Abordarea adoptată în acest sens este orientată pe material și decurge din analiza ansamblurilor de artefacte în tandem cu contextele și stratigrafia tuturor episoadelor de distrugere prin incendiu identificate pentru a reconstitui relația dintre caracteristicile artefactelor – condiții, locație și conservare – și tipul de abandon – rapid/gradual, neplanificat/planificat – al întregii așezări sau părți ale acesteia. O reevaluare a ansamblurilor din unitățile afectate de distrugerea incendiilor ne permite să clarificăm aspecte legate de apariția și natura acestor evenimente.*

***Keywords*:** *fire destruction, artefact assemblages, abandonment processes, Early and Middle Bronze Age, Cyprus*

Cuvinte-cheie: *distrugere prin incendiere, ansambluri de artefacte, abandon, Epoca Bronzului timpurie și mijlocie, Cipru*

◈ Introduction

Rapid destruction events provide key information on the function and organisation of space in ancient settlements. Among these, damage or destruction by fire is among the most recurring observable in the archaeological record. This work analyses destruction episodes associated with fire in Early and Middle Bronze Age settlements on Cyprus (ca. 2250–

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1650 BCE) (fig. 1). The goal is to make a review of such destructive events across the island to compare and interpret the different episodes and evaluate their significance. To achieve these aims, this paper is structured as follows. First, after establishing the historical background of the study, we introduce relevant theory and interpretations of fire destruction events in current literature on archaeological abandonments. Second, we present the case studies from Early and Middle Bronze Age Cyprus (or Early Cypriot [EC] and Middle Cypriot [MC]); namely, settlements showing episodes of fire damage or destruction. Within this section, an accurate analysis of the material assemblages is provided and the Cypriot record is used to test the idea that artefact-based analyses can be leading evidence to study abandonment as stratigraphy and micromorphology are. In fact, the core idea behind this paper is that the conditions, location and preservation of artefacts discovered in units and spaces that underwent fire destruction can provide crucial information not only about the episodes themselves but also on the processes of abandonment of the areas investigated. In addition, they facilitate the identification of activities performed in the spaces that underwent the fire episodes during their use, especially concerning their last function. This has led us to propose a method for the analysis and evaluation of the material culture of a built unit or a site in relation to different types of abandonments (*i.e.*, the artefact assemblage to abandonment [AA–A] relation). Lastly, the selected episodes of fire destruction are interpreted and the different sites compared to obtain an overview of fire destructions across the island.

The periods considered in this study are of interest from both an archaeological and a historical standpoint. While considerable emphasis has been placed on abandonments and shifts in settlement patterns occurring between the end of the MC and the beginning of the Late Cypriot (LC), less attention has been given to earlier periods, especially in relation to social changes and strategies (Georgiou 2017 with references to his previous work). Therefore, encouraging studies that provide detailed insights into specific phenomena associated with abandonments (*e.g.*, those related to fire) can contribute significantly to enriching our understanding of these periods. This is particularly important in light of a re-evaluation of the complexity of social dynamics of both the EC (Laoutari 2023) and MC (Webb, Knapp 2021, p. 204).

◈ Historical background

The Philia period (ca. 2500–2200 BCE) marks the beginning of the Early Bronze Age in Cyprus. This period saw the introduction of new technologies and lifeways, often attributed to migrations from Anatolia, though alternative perspectives emphasise local developments or the hybridization of traditions (*e.g.*, Bolger 2013; Knapp 2013a, p. 264-276; Webb 2013; Crewe 2023). In contrast, the subsequent EC I-II is characterised by regional differentiation in material culture (in particular, ceramic styles), departing from the relative uniformity attributed to the mature Philia phase (Webb, Frankel 2013a, p. 64-70; Bolger, Peltenburg 2014). Scholars generally distinguish two broad cultural regions: the north coast and a larger area encompassing the central Mesaoria plain and south-western Cyprus.

Despite regional variation, settlement continuity from the Philia to the EC I-II period is evident at sites such as Marki *Alonia* and Kissonerga *Skalia*, as well as in funerary contexts at Sotira *Kaminoudhia* (Swiny *et alii* 2003; Frankel, Webb 2006; Crewe 2015). The primary disruption occurs on the north coast, where the significant Philia site of Vasilia is abandoned, and Bellapais *Vounous* emerges as a prominent site, though primarily through its cemetery rather than settlement evidence (Webb 2018a). Even though ceramic divergence suggesting

cultural fragmentation, trade and exchange persisted, as seen in sporadic imports and imitations of north coast pottery at sites like Psematismenos *Trelloukkas* (Webb, Frankel 2013a, p. 73-74, fig. 13). Furthermore, metal objects at Vounous with non-Cypriot compositions point to external contacts (Crewe 2015, p. 144-145). From the EC III period onward, trade networks expanded once more, with north coast ceramic styles spreading island-wide, driven in part by copper production and exchange.

The EC and the following MC periods have traditionally been interpreted as a time of small-scale, egalitarian village societies, with major transformations only occurring at the MC III/LC I transition (*e.g.*, Knapp 2013b). However, recent research suggests a gradual increase in social complexity throughout, at least, the MC (Bombardieri 2017, p. 362-363; Crewe 2017; Webb, Knapp 2021). While some settlements, such as Marki and Alambra, retained a village-based organisation, others exhibited new spatial arrangements, including communal gathering spaces and dedicated production areas, as seen at Ambelikou *Aletri*, Erimi *Laonin tou Porakou*, and Politiko *Troullia* (Falconer, Fall 2013; Webb, Frankel 2013b; Bombardieri 2017). The cemetery of Lapithos *Vrysi tou Barba* is the only MC site extensively excavated in the north coast. The tombs and their assemblages suggest that the site played a crucial role in metallurgy and trade, indicating early signs of hierarchy and interregional connectivity (Webb 2018a).

Indicators of increasing complexity include monumental architecture, increase in storage capacity, surplus production and the development of exchange networks. By the MC I-II period, non-domestic workspaces appear, sometimes as structured working areas (*e.g.*, Ambelikou, Erimi) and, at other times, as large communal, multi-functional courtyards (*e.g.*, Politiko, Kissonerga) (Crewe, Hill 2012; Falconer, Fall 2013; Webb, Frankel 2013b; Bombardieri 2017). These spaces likely served both economic and social functions, reinforcing community cohesion alongside production. The role played by the EC and MC towards transforming into the LC society and economy remains a subject of debate, requiring further investigation to elucidate the long-term trajectories of Cypriot social and economic structures.

◈ Destructions by fire: types, definitions, and their relation to abandonments

The presence of burnt layers in collapsed buildings can be interpreted in a variety of ways, but it is ultimately linked to two outcomes: damage repair, reconstruction and reoccupation of the destroyed spaces, or abandonment. Concerning the latter case, the scale of such events is a determining factor for the partial or complete destruction of single rooms, areas or the totality of a settlement and to what extent they could have contributed to or caused its abandonment. Throughout the history of a settlement, events of destruction by fire can occur during its occupation, before its final abandonment (pre-abandonment), at the time of its abandonment (peri-abandonment), or after its abandoned (post-abandonment). Recent studies have remarked that fire destruction occurring at any of these stages can be the result of unforeseen incidents as much as deliberate and even planned, gradual actions.

Chapman identifies six common causes of destruction by fire in antiquity, which may have affected single units as well as entire settlements. These are: enemy attacks, accidental destruction occurring during daily life, pest control, production of water-resistant structures, deliberate destruction aimed at the reuse of building materials and ritual (Chapman 1999, p. 115). Deliberate destruction is often manifested through "domicide" (Tringham 2005 and 2013). This act foresees the demolition of a house, often by burning it down by human agents for different reasons such as forms of violence (repression, eviction, etc.) (*e.g.*, Tringham 2013;

Kirsteen, Cooper 2017), or ritual, once the owner had died to symbolise the parallel end of the house's life circle (Tringham 2005, p. 106-107). An exemplary case of domicide is represented by destructions observed in settlements of the Vinča culture (Balkans). Here, the possibility that fuel was introduced in the buildings before their destruction was highlighted (Stevanovic 1997) and has now proven by experimental archaeology (*e.g.*, Bankoff, Winter 1979; Gheorghiu 2008 and 2019; see also Chapman 1999). Moving on to post-abandonment fire-related events, it must be noted that these comprise either accidental or voluntary actions due to natural or anthropic causes, which include return to or reoccupation of a site (Schiffer 1987; Gerristen 1999, p. 88-89, fig. 5).

Based on the archaeological evidence, it may be difficult to determine which of the above-mentioned causes is behind the formation of a burnt deposit. Also problematic, is how to determine the relationship between fire destructions and abandonments. However, it is common sense to consider fire destruction as a major reason for the abandonment of a building or a site, especially when the damage is extensive and requires an investment in workforce and resources that overcomes the effort of relocation. Instead, when fire destruction is constrained to single units or areas and requires a sustainable investment of resources to rebuild collapsed structures or renovate the spaces, it may not be a reason for abandonment. It has been often remarked that ancient settlements were in constant renovation (Cameron 1993, p. 5; for Cyprus see Frankel, Webb 2006, fig. 11.1-11.8; 2012) but were also characterised by periods of crisis and depopulation that could have caused the disuse and dismantling of buildings and spaces (intra-site abandonment [Cameron 1993, p. 4]), altering the distribution of the cultural materials left behind. Therefore, it will be crucial to determine at which point of the settlements' biographies a particular fire event occurred. Before proceeding to examine the Cypriot case studies in detail, it is important to first introduce how the relationship between artefact assemblages and abandonment is considered and investigated.

◈ The artefact assemblage to abandonment (AA–A) relation

The type of abandonment (rapid/gradual, unplanned/planned) of a built unit or a site and the state and composition of the residual artefact assemblage are inextricably bound (Brooks 1993). Gradual abandonments of buildings and sites occur more frequently than rapid ones in the archaeological record as these are due to exceptional circumstances (Cameron 1993, p. 4). In contrast, rapid abandonments may crystallise the last – often dramatic – moments of the life of a settlement through the remains of its architecture and artefacts. The majority of artefact assemblages from areas abandoned gradually and not reoccupied are the result of processes of disuse and discarding (on this topic, see Seymour, Schiffer 1987; see also Stevenson 1982, p. 237). Therefore, these dynamics must be examined and understood before hypotheses of the function of units and spaces abandoned gradually can be formulated. In gradual abandonments, furthermore, areas of ruins and dismantled buildings may coexist with areas that continued to be occupied and maintained. In this case, the quantity and quality of artefacts that characterise the units' assemblages depends on intra-site abandonment behaviours, such as scavenging, relocation, misplacement and reuse, which can greatly alter the original locations and distributions of the material culture (Cameron 1993, p. 5). Fire events can have a strong impact on the usability of artefacts and building materials and reduce the chances of alteration of the original assemblages in intra-site abandonment and the prospects of immediate resettlement, sporadic frequentation or squatting during post-abandonment (Seymour, Schiffer 1987, p. 553-554; Schlanger, Wilshusen 1993, p. 90).

There is an informative relation linking destruction, abandonment and the conditions of artefact assemblages retrieved from settlement units. In this work, this relation is indicated as AA–A. Looking at artefacts, it is logical to propose that, in case of sudden, unforeseen abandonments, the objects left behind highly reflect the picture of the original unit assemblage. In the case of planned abandonments, a variable number of still usable objects can be moved, depending on the needs, intentions and decisions of the movers and the modalities of abandonment. The location of artefacts is also meaningful in relation to abandonments. Doorways, corridors, and alleyways that are normally kept clear from refuse tend to appear relatively empty in case of an unplanned destructive event. In contrast, in planned processes, accumulations of discarded objects in spaces usually clean during the occupation are visible (Stevenson 1982, p. 246).

Concerning fire destruction, patterns obtained from analysing the presence, distribution and conditions of ceramics and other artefacts retrieved from a burnt context bear important information towards establishing the nature of a fire event (*e.g.*, voluntary, accidental, planned, caused by a catastrophic event) (Lightfoot 1993). For example, in the case of deliberate destruction for building renovation or pest control, items were tendentially removed from building units before setting the spaces on controlled fire. Thus, the type of assemblages and characteristics of single artefacts retrieved from a burnt context can be extremely informative to determine the type of fire event. However, it cannot provide us with an answer to all the questions related to the complex reconstruction of a fire event, for which the integration of different data (*e.g.*, stratigraphic and micro-stratigraphic, residue analyses, artefact-related) is always the best strategy. Although objects in context can offer an enormous informative insight, other data, when available, is necessary to integrate into the picture to gain a fuller understanding of events leading up to a destructive episode.

◈ Methodology for the analysis of the artefact assemblages

Different aspects of a unit assemblage can be considered to characterise the type of abandonment a certain space underwent. Specifically, we consider the number of objects retrieved, their preservation extent and their portability. In addition, the degree of consumption and use-wear of certain artefacts, such as tools, which when contextualised, can provide information on decision making during abandonment. The presence and types of small finds can also add to this picture.

Concerning the extent of preservation of the objects, we note the percentages of complete and intact objects and those restorable – namely, artefacts that are 2/3 or more preserved (Frankel, Webb 2006, p. 153-154) – and consider these objects as being used before the destructive episode, during the last occupational episode of the unit that yielded them (Schiffer 1972, p. 160). In contrast, objects that are less than 2/3 preserved are more likely to be residual or intrusive and this likelihood increases with a reduced level of preservation. In relation to the extent of preservation, we also look at usability, namely whether the objects retrieved from the analysed destruction contexts were still usable or unusable (*e.g.*, exhausted, refuse, faulted). We then reflect upon the portability of the objects: although most objects are portable, meaning that can be moved from their original position by one or more people, some were more difficult to transport due to their size and weight. In general, assemblages comprise artefacts of different sizes from large and heavy storage vessels and grinding tools, such as querns, to small-sized artefacts, for example, spindle whorls and ornaments, which can also bear a personal or precious value (*e.g.*, Douglas 2019, p. 272-278; Douglas, Muti 2019). By

looking at this aspect, we evaluate whether concentrations of materials left behind comprise large and heavy objects, artefacts with mixed characteristics but predominantly medium and large, or if it also includes small finds. This facilitates a better definition of the nature of the destructive episode and allows us to link it to possible attempts to recover still usable objects. In the examination of ground stone tools, we have taken into account the differentiation between two typologies of objects that possess varying propensities for curation at the time of abandonment. These comprise curated tools, requiring meticulous shaping to fulfil their intended functions, and expedient tools, characterised by a more *ad hoc* or temporary nature (Webb 1998, p. 797).

Considerations of the above indicators are combined with the level of fragmentation of the assemblage. If large and heavy pots or tools are present in the assemblage, especially in combination with fragmentary material, we interpret them as deliberately left behind after a possible attempt to recover other materials. In contrast, a space abandoned with minimal or no attempt to recover usable artefacts – where significant quantities of intact, small-sized objects are present – can be associated with rapid abandonment, indicating an inability or unwillingness to retrieve the material. However, it must be highlighted that contextual situations can be more nuanced and will be evaluated case by case.

It is necessary to introduce a number of caveats concerning the sourcing of the data. While scrutinising the site reports to produce the dataset of artefacts for this study, we have come across issues of inconsistency in the number and description of the characteristics of the material between publications regarding the same site or between chapters of a single volume. Therefore, we have decided to use primary data sourced exclusively from the report volumes of the sites. In the case of sites published in more than one volume (*i.e.*, Marki *Alonia*), we have considered the information in the most recent one, if reiterated or revised. In case of inconsistencies between chapters, the diverging information was cross-checked with illustrations, plans and photographs. Having defined the theoretical and methodological pillar on which this study is based, we will move on to the analysis and discussion of the Cypriot record in the next sections.

◈ Fire destructions in Early and Middle Cypriot settlements

Few settlements have been systematically investigated for the EC and MC periods and none were excavated on the north coast or in the east before the military occupation of 1974 (for the extent and nature of the areas investigated at Ambelikou see below), limiting our understanding of settlements on the central plain and south/south-western coast of the island. Destruction layers produced by conflagration events are visible in the majority of EC and MC settlements that have been identified so far. To characterise fire events and investigate abandonment dynamics through the AA–A relation, the case studies selected below fit the following conditions: settlements with buildings that displayed abandonment contexts that were destroyed by fire and had artefacts left on the floors and were not disturbed by subsequent resettlement. To date, the sites also correspond to the totality of settlements investigated for the periods through extensive and systematic excavations and for which at least one full report is published. These are: Sotira *Kaminoudhia* (Swiny *et alii* 2003), Marki *Alonia* (Frankel, Webb 1996 and 2006), Ambelikou *Aletri* (Webb, Frankel 2013b), Alambra *Mouttes* (Coleman *et alii* 1996; Sneddon *et alii* 2022) and Erimi *Laonin tou Porakou* (Bombardieri 2017).

Sotira *Kaminoudhia*

The settlement of *Kaminoudhia* and two cemeteries lay on a series of gently sloping terraces on a hill rising to the east side of the Simvoulos stream, north of the modern village of Sotira (Swiny *et alii* 2003; Swiny 2008, p. 21). Three areas (A, B and C) and two occupational phases (1 and 2) were identified. Area A displays domestic units connected by long alleyways that were occupied during both phases 1 (EC I-II) and 2 (EC III) (Swiny *et alii* 2003, p. 10). Units excavated in areas B and C show similar architectural features of domestic buildings, but their function has been interpreted, respectively, as ritual and productive (Swiny 2008; Swantek, Weir 2021, p. 221-222). Both areas are monophase, uniquely displaying the last occupational phase of the settlement (phase 2) (Swiny *et alii* 2003, p. 34-52). Concerning areas B and C, the present study does not include data from the most recent excavation campaigns, carried out in the early 2000s and currently unpublished (Swiny 2008, p. 43; Swantek, Weir 2021, p. 221-222).

Intra-site and final abandonments

Different pieces of evidence led the excavators to hypothesise that the settlement was destroyed by an earthquake that caused its rapid abandonment (Swiny *et alii* 2003, p. 53). The high occurrence of burnt layers in the uppermost sequence of the units in area C is one such example and it will be analysed and discussed below in more detail. Another is the absence of any signs of immediate or later reoccupation of the site, as well as the extensive damage observed in the stone walls of units 1, 6, and 12 in area A. The presence of one unit "collapsed with artifacts still in place" (unit 6, area A) and of human skeletal remains in units 6, 16, 44 (area A) and 22 (area C) are brought as additional pieces of evidence to support the rapid abandonment due to a seismic event (Swiny *et alii* 2003, p. 53).

Skeletal remains in units 44 (area A) (Swiny 2008, p. 45-46) and unit 22 (area C) (Swiny *et alii* 2003, p. 50-52) belong to two young female individuals and isolated bones were retrieved from units 6 (Swiny *et alii* 2003, p. 21-23) and 16 (Swiny *et alii* 2003, p. 27-28) in area A. In this respect, it must be anticipated here that intra-mural burials, even though rare, have been attested in most EC and MC sites and are now considered to be part of the mortuary practices of the period (Webb 2018b, p. 212-214; Sneddon *et alii* 2022, p. 14-17, 112-113; Bombardieri 2023a). Even if some of these burials show evidence of curation, such as burial features (stone cysts?, *pithoi*) or association of significant material (*e.g.*, metal artefacts, jewellery), such as at Marki *Alonia* and Alambra *Mouttes* (see below), it cannot be excluded that some individuals were placed in units under abandonment with no burial features or associated objects (Webb 2018b, p. 214). In this light, it is uncertain to use the skeletal remains in domestic units at Sotira as evidence for a large destructive event, as it will be further discussed below (also Swiny 2008, p. 45 on the difficulties of interpreting the human remains from unit 44). Instead, the AA–A analysis for each one of these units may shed more light on this piece of evidence and combined can enhance our understanding of the events of the conflagration and abandonment of the site.

The burnt units and their assemblages

Roofed units 8, 9, 17, 21, 22, 23 and external units 2 (courtyard) and 25 (alleyway), concentrated in area C, yielded important traces of destruction by fire (Swiny *et alii* 2003, p. 39-52). Their stratigraphy shows the presence of consistent ashy layers that cannot be interpreted with fire-related activities, such as cooking, but their extension and accumulation suggest conflagration (fig. 2). An excellent example of this is unit 8, which displays a peculiar

triangular plan (Swiny *et alii* 2003, p. 42-44). The ash that characterises the deposit which underlies the final collapse of the unit's wall was interpreted by the excavator as the result of the accidental burning of the unit's roof or the combustion of the material stored in the unit (Swiny *et alii* 2003, p. 43). The only fireplace in area C was discovered in unit 2, a courtyard-like space delimited by a wall shared with all the other rooms that yielded evidence of fire destructions (Swiny *et alii* 2003, p. 39). As the ashy layers are recurrent in the stratigraphy of contiguous units in area C, they seem to point to a series of fire events that probably originated from one another within a short period. This can be a clue in support of an event that affected more than one unit at the same time.

The artefact assemblages retrieved from these units comprise pottery, ground stone, metals, chipped stones and small finds of various function, especially textile tools and ornaments. Table 1 presents the relevant data concerning the analysis of the artefact assemblages of these units. It can be noted that the number of complete or restorable vessels recovered from the habitation surfaces are between zero and seven. These are of different sizes but can all be considered as movable. It is not specified whether the fragmentary material comes from the habitation level, or if it was also retrieved from the associated deposits. As anticipated, units in area C are single-phased and the sherds can be assigned to their only and last occupation episode. Unfortunately, the preserved extent of the incomplete diagnostic pottery is not provided. It is thus impossible to establish whether incomplete vessels were complete and underwent minimal loss at the moment of their abandonment or discard, a type of analysis particularly suitable for the cases of sudden/violent collapse of architecture, of which the destruction of materials is a direct consequence.

Concerning the ground stone tools, both unmovable and movable objects were frequently left behind. A prevalence of unmovable grinding tools left in unit 8 can be linked to the function of this space. Few, complete small finds of various types, especially tools and ornaments, were also found in the units. The fact that these were left behind intact is noteworthy and may be a clue for their abandonment while still functional or even in use. As for the chipped stone assemblage, unit 21 yielded evidence of knapping stone reduction, with evidence for raw materials, semi-finished products, waste, debris, and tools that points to different steps of knapping (Kingsnorth 2003, p. 335). Kingsnorth observed that half to 2/3 of flint specimens in the unit assemblages are burnt, and percentages are higher in the ashy layers (Kingsnorth 2003, p. 309-311). Even though it was not possible to ascertain whether and if some of the lithic assemblage were heated as part of the production process, it is likely that most were accidentally heated due to contact with fire.

Marki *Alonia*

Marki *Alonia* is located on the south bank of the Alykos River, ca. 25 km south of the modern capital city of Nicosia (Frankel, Webb 1996, 2006). Like Sotira, Marki is a small/medium sized village displaying an agglutination of single or multi-roomed domestic buildings or compounds, some enclosed by a walled courtyard. The site shows a long occupational sequence ranging from the EC Philia to the MC II over a total of nine phases (A-I) (Frankel, Webb 2006, p. 1, 36-41).

Intra-site and final abandonments

Throughout its long life, Marki suffered periods of depopulation, resulting in the disuse and subsequent collapse of some compounds, while others remained in use (Frankel, Webb 2006, fig. 11.1-11.9). Compounds underwent multiple construction and refurbishment

episodes, and the use and abandonment of the units produced artefacts in their primary context or *de facto* refuse. In some cases, objects still usable were left on the floor or ended up included in the preparation layers for the subsequent floors. In units IX, X, XIII or LXVI, for example, different almost complete to complete artefacts were left behind in the disused rooms prior to the final abandonment of the site, characterised by Frankel and Webb (2006) as the result of a gradual process caused by social and environmental factors. The enormous quantity and quality of data retrieved allowed the excavators to understand the dynamics of renovation and intra-site abandonment of single domestic compounds and to relate them to a gradual decrease in the village population and a long-paced process of abandonment (Frankel, Webb 2006 and 2012, p. 479). Before moving on to analyse the artefact assemblages, it is crucial to observe that the site's flat plateau was partially affected by erosion and slope washes which caused the partial collapse of northern parts of the settlement towards the Alykos River.

It is also noteworthy that the highest percentage of >2/3 preserved objects was not associated with the last phases H-1 and I-1 of the village life (Frankel, Webb 2006, tab. 4.14). Such objects comprised vessels, metals, ground stones and small artefacts, including chipped stone, textile tools and ornaments. The frequency and distribution of the material in tandem with the stratigraphy and the absence of signs of rapid destruction suggest that these artefacts are residual within a gradual process of abandonment (Frankel, Webb 2012, p. 479). Buildings showing an early abandonment in the site's sequence were dismantled but complete objects mixed with exhausted, broken or fragmentary artefacts could be still found among their ruins (Frankel, Webb 2012, p. 479-480).

The burnt units and their assemblages

Test excavations in squares R11 and S11 – 200 m south to the main area – brought to light the four adjacent units I, II, III and IV, partially destroyed by modern terracing (Frankel, Webb 1996, p. 29) (fig. 2). These units were disused and abandoned during the most recent phase I-1 (Frankel, Webb 2006, fig. 3.1). A burnt layer and some complete and fragmentary artefacts, in some cases likely discarded inside the units after disuse, were detected on the uppermost floors (Frankel, Webb 1996, p. 28). The sherds' distribution in the stratigraphy of these units supports the hypothesis that some objects were tossed among collapsed architecture (Frankel, Webb 1996, p. 29). Additionally, small finds were retrieved in a fragmentary state, while the majority of ground stones were found complete (Frankel, Webb 2006, tab. 6.3-6.45).

A burnt layer possibly associated with their disuse or immediate post-abandonment was detected in units XXX and XXXI, with smashed artefacts underlying it (Frankel, Webb 1996, p. 37-38). Despite the fact that some ground stone tools and vessels were almost complete, the assemblage was fragmentary (tab. 2). In contrast with units I, II, III and IV, the conflagrations that destroyed rooms XXX and XXXI can be ascribed to the previous phase H-1 (Frankel, Webb 2006, fig. 3.1). One other possible fire event is testified by the presence of some thin and shallow lenses of burnt material in the northern sections of rooms IX and X. This fire belongs to phase D-1 (EC III) and was followed by cleaning, demolition of some walls and the transformation of the area in an unenclosed space (Frankel, Webb 2006, p. 43).

Ambelikou *Aletri*

Two areas (1 and 2) of the site were excavated before 1974. These are located respectively on the western and northern slopes of the Aletri hill, nearby the modern village of Ambelikou, on the north-western side of the Troodos Mountains (Webb, Frankel 2013b).

The two areas had a productive function and were located outside of the main extent of the settlement, which remains largely uninvestigated. Area 1, characterised by 10 units divided by stone walls, was designed to be a metallurgical workshop, while area 2, comprising six units, functioned as a pottery workshop (Webb, Frankel 2013b, p. 56).

Intra-site and final abandonments

The abandonment of the two areas is described as coeval, sudden, and catastrophic, probably caused by an earthquake (Webb, Frankel 2013b, p. 225). The short life of the site, founded in the MC I, was interrupted no later than the MC II. No evidence for resettling could be identified in the two productive areas and no archaeological materials dating beyond the MC II were recovered in the trial trenches excavated in the settlement and tombs investigated in the nearby area of Ambelikou *Theotokou* (Webb, Frankel 2013b, p. 225). Area 2 shows evidence for a sudden and destructive fire episode, whilst area 1 appears less damaged and no signs of extensive fire could be identified (Webb, Frankel 2013b, p. 61-62). Also to be remarked is that area 2 was probably not completely limited by walls on all its sides (see the reconstruction in Webb, Frankel 2013b, p. 215, fig. 11.8). As a consequence, a higher dispersion of materials could be hypothesised. However, the analysis of the artefacts assemblage presented below suggests little alteration of the vessels' distribution and degree of preservation by natural formation processes.

The burnt units and their assemblages

Ashes and "black or very dark material, probably the product of fire" were identified in the deposits that can be ascribed to the final use and abandonment of area 2, the pottery workshop (fig. 2) (Webb, Frankel 2013b, p. 62). Even though firing is key in pottery production, these traces are extensive and cannot have been produced by usual pottery firing activities. While re-examining the material, Webb and Frankel (2013b, p. 62) assessed two trays holding a total of 1430 burnt sherds. If some can be production wasters and misfired sherds, most seem to be "workshop debris", namely the result of conflagration described by the excavator (Webb, Frankel 2013b, p. 62). Furthermore, a large quantity of vessels and other artefacts were found *in situ* (Webb, Frankel 2013b, p. 62-63, fig. 5.21).

Figure 3 and table 3 summarise the relevant data concerning the analysis of the artefact assemblages of these units and provide details regarding the type of artefacts recovered and their preservation extent. In total, 77 vessels were found, of which 66 were retrieved from unit I. Overall, across all rooms in Area 2 (namely, those affected and not affected by fire destruction), 64 vessels (83% of the pottery assemblage) are complete or preserved to at least two-thirds of their original form, while 13 vessels are fragmentary (17% of the assemblage). As hypothesised by Webb and Frankel (2013b, p. 63-69), the majority of vessels fell from a series of benches which were used to store vessels off the floor in unit I, with the workshop's floor most likely clean when in use and immediately before abandonment. The location of the scattered vessels, thus, crystallises in the archaeological contexts the result of the conflagration and its destructive power.

Four spindle whorls, 1/2 to completely preserved and showing use-wear traces, and 17 transportable ground stone and a quern and a rubber were also retrieved from area 2 (Webb, Frankel 2013b, p. 151-157). A complete plank-shaped figurine was found at the entrance of the workshop (Webb, Frankel 2013b, p. 170-172): the figurine, along with a stone example from Politiko *Troullia* (Falconer *et alii* 2014), is the only intact example so far known from a settlement context, where these kinds of artefacts are generally very fragmentary and the result of disposal activities (Frankel, Webb 2006, p. 155-156; Falconer, Fall 2013, p. 110).

Alambra *Mouttes*

Alambra is located south-east of Marki, in an area where the central plain meets the Troodos foothills. Excavations in the locality of Mouttes exposed a small area with seven single-phased domestic compounds, dated back to the MC I-II, with rectangular/trapezoidal plans having direct access from the outside and architecture characterised by mudbrick superstructures on stone foundations (area A, buildings I-VII) (Coleman *et alii* 1996, p. 33-107, fig. 14). In the early 2000s, other domestic compounds of the same period were brought to light in two nearby, different areas B and C (Sneddon *et alii* 2022) (fig. 2). The main areas are located on the north-eastern part of the Mouttes hill (Sneddon *et alii* 2022, p. 6, fig. 1.4). Area C is situated on flat land, while area B on a terrace further north.

Intra-site and final abandonments

The stratigraphy of area A suggests that the settlement was short lived but abandoned gradually. None of the compounds exposed there showed traces of fire events. A massive accumulation of "soil" and debris, indicated as the "filling", overlying the occupational levels seems the result of gradual, post-abandonment building collapse and disintegration (Coleman *et alii* 1996, p. 19-20). Area A, built on the northeast side of the Mouttes hill, was particularly exposed to slope wash. The presence of reinforced walls near a ravine, to counteract the action of running water, may indicate a reason behind the abandonment of the area (Coleman *et alii* 1996, p. 20). A large amount of still usable objects was left in the compounds. As observed by the excavators, some objects retrieved from the "filling", when found within rooms, may have been part of the compounds' assemblages (Coleman *et alii* 1996, p. 90-91). Typical assemblages comprise complete or restorable vessels, spindle whorls, picrolite objects, metal tools and stone tools, particularly concentrated in building IV (Coleman *et alii* 1996, p. 147). It is interesting to note that the higher presence of ceramic sherds in specific rooms, such as 96 small and 43 large fragmentary bowls from room 3 in building 1 (Coleman *et alii* 1996, p. 41, fig. 105), can be put in correlation to discard processes occurring during the disuse of the area. In fact, some of the rooms in different compounds seem to have been out of use before the abandonment of the area. One other case is room 6 in building IV, that was disused before the adjacent units (Coleman *et alii* 1996, p. 77) and yielded only a quern, a mortar and sherds (Coleman *et alii* 1996, p. 85). Instead, the nearby room 8 in building IV, probably used for communal purposes, was abandoned with intact or almost complete objects.

In contrast to area A, diverse buildings in areas B and C show traces of fire events, which will be analysed in more detail in the following section. It is worth anticipating, though, that, in the light of the new evidence, the abandonment of the village could have been the result of growing social tension within the local community, as it would be also reflected by the fragmentary organisation of the village (Sneddon *et alii* 2022, p. 110). However, the excavators propose an understanding of the stratigraphy that places the burnt layers immediately after the abandonment of the structures, interpreting them as accidental events (Sneddon *et alii* 2022, p. 113-114).

The burnt units and their assemblages

The compound excavated in area B, comprising units I-III, shows traces of fire destruction (Sneddon *et alii* 2022, p. 9-14, 112) (tab. 4). Unit I yielded six complete or reused and one fragmentary ground stone tools (otherwise indicated as 15 [Sneddon *et alii* 2022, p. 11]) and vessels >1/3 preserved or sherds, suggesting that, if complete artefacts were present, they were collected before its disuse (Sneddon *et alii* 2022, p. 11). In contrast, nearly 40% of pottery

in the adjacent unit II was found complete or >2/3 intact, probably used as a storage room (Georgiou 2008, p. 135-137; Sneddon *et alii* 2022, p. 12). Almost all the ground stones were complete and still usable; one spindle whorl, a metal pin and a chisel were also part of the room assemblage, which could suggest an unexpected destruction and fast abandonment of the compound (Sneddon *et alii* 2022, p. 11-13). However, for the excavators, the presence of repaired and possibly damaged vessels and of large, heavy *pithoi* would indicate that exhausted, non-usable and heavy objects were deliberately left behind, an action generally suggesting planned abandonment (Sneddon *et alii* 2022, p. 112).

In area C, evidence of fire events was also detected in adjacent units I (trench 2), II (trench 11) and III (trench 15) (Sneddon *et alii* 2022, p. 14-18). Unit I presents another case of primary burial in a domestic context, like the one mentioned above for Sotira. The remains of a female individual were found in the ashy levels of the unit, in association with jewellery and two small ingots, the only complete objects retrieved from the room (Sneddon *et alii* 2022; Casa 2022). The presence of such objects allowed the excavators to exclude the possibility of accidental death caused by the collapse of the structures (Sneddon *et alii* 2022, p. 16-17). Notably, the adjacent units II and III yielded few but complete vessels and other artefacts.

Traces of fire destruction associated with structural collapse were also identified in the compound excavated in trench 10, composed of two roofed units (units I and IV), a courtyard and a small space (units V and II) (Sneddon *et alii* 2022, p. 22-23). Even though the excavators report that several complete or nearly complete vessels were retrieved from the ashy mudbrick deposit overlaying the floor of unit I, they do not seem to appear in the section dedicated to the pottery analysis (compare p. 23, p. 33-66, and Appendix I in Sneddon *et alii* 2022). We are thus unable to include them in this study. Burnt units I and IV yielded a larger number of fragmentary than restorable or complete vessels along with three small and four not easily transportable ground stone artefacts and nine almost complete and fragmentary small finds (tab. 4). Notably, part of a unique, large anthropomorphic figure made of clay and plaster was retrieved from unit IV (Sneddon *et alii* 2022, p. 24).

Erimi *Laonin tou Porakou*

Erimi is situated on a high limestone plateau in the middle course of the Kouris valley, modern district of Limassol. Ongoing investigations at the site have allowed archaeologists to identify two main settlement areas (areas A and B-B2+T2-T5), organised in a series of open spaces and units, and two funerary clusters (area E) (Bombardieri 2017). Area A, interpreted as a "workshop complex", occupies the flat top of the hill (Bombardieri 2017, p. 21-58). Further down on the first lower terrace, trenches B-B2+T2-T5 have yielded a series of possible domestic units (Bombardieri 2017, p. 58-72; 2023b, p. 4). Two phases of use, A and B, have been recognised in both the main areas.

Intra-site and final abandonments

A distinctive feature in the site's architecture is that the foundations of built units are carved in the bedrock. As a result, the plans of single units are rarely altered from the earlier to most recent occupational phase. Phase B levels in both areas, normally appeared empty and cleaned up on renovation, even though sherd counts vary from unit to unit (G. Muti, personal observation). Unit SA I in area A seems to diverge from this pattern as it yielded both >2/3 preserved to complete artefacts and sherds, and fragmentary diagnostics in a burnt layer of phase B, interpreted as the construction packing to the phase A floor (Bombardieri 2017, p. 32-33).

The final abandonment of the site seems to coincide with important fire-related destructions detected in some not contiguous units in the workshop complex (Amadio, Bombardieri 2019; Amadio *et alii* 2020) (fig. 2). Among the 14 rooms so far excavated, four appear burnt down (SA I, III, V and XII), five are partially burnt (SA IIa, IIb, IV, XIII and XV), while no signs of conflagrations were noted in the reminder five ones (SA VI, IX, X, XI and XIV) (Villani, Tripodi 2024; see also Amadio *et alii* 2023) (fig. 4). Due to the location of area A, it must be also reminded that natural formation processes partially affected some of the units (*e.g.*, SA XII) that were found particularly exposed to erosion and slope wash on its northern limit. With the exception of unit 6, no burnt units were identified in B-B2 and T5, interpreted as domestic buildings. All are characterised by fragmentary assemblages.

Based on microstratigraphy and preliminary considerations of the archaeological material, Amadio and Bombardieri (2019, p. 7) have hypothesised that the workshop was deliberately set on fire with "selected objects left behind as part of collective memories". Specifically, microstratigraphic analysis has shown that the burnt deposits were overlaid by a layer of mudbricks that would have sealed the fire event at the bottom of the abandonment sequence (Amadio *et alii* 2020, p. 305). The presence of intact vessels, including four piled complete bowls brought to light in front of the entrance of unit SA IV with the one on top placed upside down, and the possible removal of exhausted or frequently used artefacts would be part of a symbolic and deliberate act of closure (Amadio *et alii* 2020, p. 309-317). However, a more refined analysis of the occurrence and degree of preservation of different categories of artefacts from the workshop complex has shown that most artefacts were probably already in a fragmentary state when the fire destroyed the structures (Villani, Tripodi 2024). Building on this study, we propose below an analysis of the burnt units in the workshop and their assemblages.

The burnt units and their assemblages

Destruction following fire events was identified in 9 out of 14 roofed workshop units excavated and in settlement unit 6. This unit yielded objects complete or >2/3 preserved, including a terracotta mould and ceramic and metal small finds (Bombardieri 2023b, p. 4). The assemblage, however, is mostly composed of fragmentary artefacts, indicating that only a small part of these objects was possibly intact when the unit was destroyed and abandoned. Although still under investigation, preliminary analyses of the assemblage seem to indicate that the unit's abandonment process is comparable with the one detected in area A rather than the one so far observed in the settlement (Bombardieri 2023b, p. 4-5).

Table 5 summarises the data concerning the assemblages of these units. Concentrations of still usable objects in most of the burnt units led Villani and Tripodi (2024; see also Villani 2022) to propose that such units were used until the final abandonment, whilst concentrations of fragmentary artefacts and the low occurrence or absence of complete objects in unburnt and some of the burnt units may indicate that they were disused before or during the final abandonment. Even if the majority of most complete artefacts were recovered in burnt or partially burnt units, >2/3 preserved to complete vessels represent only ca. 1/3 out of the total amount of material retrieved from all the units. In addition, not all the burnt units yielded high concentrations of artefacts, suggesting that some were left empty (at least, of non-perishable material) upon abandonment (*e.g.*, SA V [tab.5]) (Villani, Tripodi 2024). Generally, traces of conflagrations are visible in phase A stratigraphy, with the exception of SA I (Bombardieri 2017, p. 33-35). At Erimi, furthermore, the occurrence and level of preservation of the artefacts in different units with a similar productive/communal function is not always

consistent with a single abandonment pattern and some of them do not display a different AA–A relation when compared to domestic units in coeval sites. SA IIb is one of the richest units, which has yielded a possibly complete assemblage. At the same time this unit is one of the smallest in the Erimi workshop complex. Due to its size and position, its primary function was that of a passage into SA IIa, it was then transformed into a possible repository before being abandoned, blocking the entrance to SA IIa, dismissed, as a consequence, before the fire episode related to the abandonment of the area (Villani 2022).

The most recent fire event in SA I can be connected with coeval fire destructions observed in the workshop complex and related to the site abandonment (Amadio *et alii* 2020). The previous episode, indicated as "charred material" and clearly visible from the photographs taken during its excavation (fig. 5), may have caused extensive damage to the phase B structures, resulting in the necessity of renovating the unit, that would bring to the construction of the phase A structures. In both phases, the function of SA I seems unchanged, showing liquid processing implements and fire-related structures connected to textile dyeing, an activity that could have posed the unit a higher risk of fire outbreaks (Bombardieri 2017, p. 28-38; Bombardieri, Muti 2018, p. 27-30; Muti 2020, p. 197-202).

Notably, this unit in phase B shows a richer assemblage of five restorable vessels (out of a total of ten recovered from the unit) along with still usable ground stone, an almost complete spindle whorl and pieces of unworked picrolite, when compared to the scarce, residual artefacts and sherds retrieved from the earlier phases of other units. In addition, more than 3000 nutlets were found in the fillings of two pits (Scirè-Calabrisotto *et alii* 2017, p. 282) (fig. 6).

These finds suggest that the pits were not emptied of their contents and the unit was roughly cleaned upon unexpected destruction, with most smashed vessels left on the floor. In addition, microstratigraphy revealed that more than 10% of the ashy layer consists of architectural material debris, such as lumps of plaster and vitrified mudbricks (Amadio 2017, p. 156), putting in relation the fire event with the collapse of structures (Bombardieri 2017, p. 31, fig. 3.18). The fact that the unit seems to retain the same function, perhaps optimised (Muti 2020, p. 200), may be also a clue of accidental destruction by fire. Furthermore, the plaster floor of phase A in WA V – the open space located in front of SA I – overlays an ashy layer projecting from the southern limit of SA I and suggests that ashes dispersed towards WA V when the roof collapsed (Bombardieri 2017, p. 34-35, fig. 3.23).

◈ Discussion

'S'i' fosse foco, arderei 'l mondo' (If I were fire, I would burn the world [authors' translation]), wrote the Medieval Italian poet Cecco Angiolieri at the beginning of his Sonnet 86 (Vitale 1956, p. 400-401). Fire's nature is to burn; it is thus somehow expected that all the EC–MC settlements investigated show evidence of conflagrations, being these extremely frequent events in the past, and not uncommon in more recent times. Destruction and abandonment episodes related to fire events analysed in the previous sections indicate how different their occurrence and characteristics are within an EC–MC settlement, especially when examined in relation to the object assemblages (fig. 7).

The AA–A analysis allowed us to distinguish the following patterns: rapid destruction caused by a natural disaster, followed (or contributing to cause) site abandonment, fire destruction possibly caused by an unexpected event upon site abandonment or in the immediate post-abandonment, partial destruction caused by an accidental and unexpected

event, followed by rebuilding, total/nearly total, deliberate, socially regulated object abandonment and possible voluntary destruction upon site abandonment.

Fire destructions observed at Sotira (area C) and Ambelikou (area 2) can be associated with accidental, unexpected and rather disastrous destruction, confirming the hypotheses proposed respectively by Swiny *et alii* (2003) and Webb and Frankel (2013b). In the areas affected by conflagration, the artefact assemblages are characterised by a large number of different artefacts in different types of contexts, domestic, collective and productive, identified in the two case studies. Generally, units yielded a large number of vessels of different sizes that were likely complete when the fire events occurred, and light and heavy ground stones and small finds. At Sotira, the low occurrence of discarded objects in area C is another clue for sudden abandonment. Different scholars have stressed the habit of keeping clean domestic spaces while in use as particularly evident in EC–MC settlements (Webb 2009; Falconer, Fall 2013, p. 110; Sneddon *et alii* 2022, p. 112). At both sites, destruction by fire seems to have originated by a single fire, possibly from a fireplace and rapidly extended to the adjacent units, provoking considerable damage and the final abandonment of the units. As already noted, these extensive fire-events are associated to a major destructive event (earthquake) that would have also caused the abandonment of the areas not affected by fire. Area 2 at Ambelikou and area C at Sotira show thus similar patterns of AA–A relations as the event that probably caused the abandonment of the sites overcomes the differences in chronology, function and, perhaps, settlement organisation visible when the two sites are compared.

A different case is represented at Marki, where fire destruction was detected in a limited area of the settlement, and in some rooms outside the area mainly investigated. This long-lived settlement was renovated several times and the absence of conflagrations, even to a small extent, in the vast majority of compounds may indicate that villagers did not use fire in the process of renovation or as pest control. The scarce occurrence of fires in the archaeological record of the site might also suggest proactivity or even prompt action to reduce the exposure to the development of large fire events that would have left traces in the stratigraphy. Fire events identified in R11 and S11 seem to be accidental and likely occurred upon abandonment or during the immediate post-abandonment of the settlement, probably when the occupants were no longer there nor interested in contrasting fire hazards. Post-abandonment fire could also be initiated or facilitated not only by the presence of flammable architectural parts but, perhaps, also by residual flammable materials used as fuel source (*e.g.*, dung, oil residues). These fire events occurred in units almost empty of artefacts, with no complete or still usable artefacts left behind and no attempts to re-build and re-occupy visible in the stratigraphy. Generally, units at Marki were cleaned upon renovation and final phases of compounds show a different range of fragmentary artefacts resulted from secondary or tertiary deposition (Webb 1995; Frankel, Webb 2012, p. 478). Some examples of >2/3 preserved or complete vessels, ground stones and small finds, reflecting the inventories of primary contexts, were also found; however, these do not represent the majority of cases.

A similar case is represented at Alambra, where burnt layers seem the result of fire events happening upon or post-abandonment and the units showing traces of conflagration have yielded similar types of AA–A relations. With the exception of unit II in area B (tab. 4), the presence of material in all the remainder units is scarce and characterised by large items showing traces of repair or nearly exhausted (Sneddon *et alii* 2022, p. 112); thus, not worthy of being moved. A larger number of different types of material were retrieved from unit II, interpreted as a storeroom by the excavators (Sneddon *et alii* 2022, p. 12). The different function

of this space may have been produced a different response/s by its users/leavers towards the objects stored there, including the easily transportable, reusable ones.

The possibility to go back and recover still usable objects after the abandonment may have played a role in the decision concerning taking or leaving behind the artefacts. As seen above, Amadio and Bombardieri (2019) suggest, on a more symbolic level, the abandonment of the Erimi communal areas was functional to transform it into a place of collective memory. The abandonment dynamics of productive and storage spaces shared by different households in a community, however, it may be the reflection of another type of social behaviour, connected to the sense of property and, perhaps, transforming space function into the social and purpose-related memory of the place. At Marki, long-term continuity in the use of some of the large compounds without reducing their dimensions was based on the legitimate use of the same plots and renovate households by the descendants of the original owner (Frankel, Webb 2012, p. 496-497). If the concept of inheritance can be related to domestic compounds, it is likely that no personal/familiar ownership was recognised in respect to the communal areas. It is not the aim of this paper to discuss the many possible and intriguing relations that this concept can find in the historical context of the MC, a period that opens up, to a vast degree, to a community-centred life and heterarchical pushes (Bombardieri 2017; Webb, Knapp 2021; Knapp 2023), but to observe that it could have impacted on the decision of leaving behind (or not taking) artefacts stored or used in such spaces. Concerning the nature of the ground stone assemblage, a noteworthy observation emerges when scrutinising the burnt units at Erimi: the majority contain expedient tools (*e.g.*, hammers or pounders) or shaped tools distinguished by their substantial size and weight (*e.g.*, mortars, querns). Based on this classification, it is evident that a significant proportion of the ground stone tools unearthed in the gradually abandoned burnt buildings are curated artefacts (*e.g.*, querns, rubbers, and mortars), deliberately left behind due to their weight and size.

When compared to unit II (area B) at Alambra, the case of the Erimi SA-named units does not look dissimilar. It must be noted, however, that all three possibilities are not mutually exclusive. Some indicators, such as four bowls of different dimensions found piled, with the top one upside down near the entrance of SA IV, seem to suggest possible symbolic closure practices performed by the inhabitants (Amadio *et alii* 2020). Others, though, may be in support of the latter hypothesis: for example, even though SA IIa, likely minimally used before the abandonment of the workshop, was left with few objects but not empty, including large and small finds. In the Erimi workshop, however, the occurrence and level of preservation of the artefacts in different units with a similar productive/communal function is not always consistent with a single abandonment pattern, such as is the case of units SA IIa and SA IIb (see analysis; also Villani 2022). Furthermore, fire-related destruction events in the Erimi workshop are not exclusively related to the final abandonment of the site, as demonstrated by the event that seems to have extensively damaged SA I in phase B before the unit underwent full rebuilding and restyling. In this respect, Erimi also offers the first example in an EC–MC settlement of partial destruction caused by an accidental and unexpected event followed by rebuilding.

The presence and location of restorable vessels, still usable ground stone objects and small finds along with the mineralised nutlets suggest that the basins in which they were retrieved were not emptied of their contents and still in use, when the fire broke out in the unit. When compared to the percentage of still usable vessels found in unit I of area 2 at Ambelikou (57/66) or in room 8 of building IV in area A at Alambra (33/40), still, the ratio is less significant (5/10), but this seems to be due to the fact that unit I and room 8 are not subject to rebuilding and reuse. Concerning the ground stone, it can be observed that concentrations

of easily transportable artefacts are found in unit II, area B at Alambra and unit SA IV, area A at Erimi. In the former case, 13 easily transportable ground stone tools were retrieved, predominantly expedient tools (*e.g.*, pounders and hammers) with others exhibiting secondary or multiple uses. Similarly, at Erimi, five easily transportable stone tools were uncovered in Unit SA IV. Excluding the axe, these tools are again expedient in nature, yet despite their transportability, they were deliberately left within the rooms. The analysis of ground stone tools aligns with the interpretation of the rapid and gradual abandonment of the respective units.

◈ Conclusions

This paper investigated the AA–A relation at EC and MC settlements to explore the conditions and dynamics of destruction and abandonment associated to fire events. In combination with key stratigraphic data, the AA–A relation, has allowed us to identify four main dynamics of intra-site and final abandonments in the analysed case studies. Overall, the analysis has evidenced that fire episodes causing the destruction of settlement units and leaving traces in their stratigraphy could be observed in all sites investigated but their occurrence is relatively low. In this respect, it is likely that fire episodes were much more frequent events, also, given the presence of fireplaces in domestic and productive units and the flammable nature of parts of the building materials (*e.g.*, wood, straws, textile or basketry-like components). As these are not detectable in the stratigraphic sequence, it might imply that attention was paid in restraining such events. Furthermore, conflagration does not seem a primary cause for major destructions nor abandonment of settlements or single areas in the EC and MC periods. In fact, the most destructive fire episodes appear as the consequence of unpredictable, natural events, likely earthquakes.

Regarding the AA–A relation, a higher degree of overall preservation (2/3 to complete artefacts), even though in a fragmentary state, is evidenced for the artefacts retrieved from fire events caused by unexpected and highly destructive events. However, objects with different functions and characteristics, from light and easily movable to medium sized or large and heavy to transport, are left behind in slower-paced and planned processes, in both burnt and unburnt units. This may be regarded as reflecting, as it depends on a variety of decisions that seem connected to the function of the buildings abandoned, ranging from discard to possible symbolic depositions. Even though the focus of the paper was to consider destructions caused by fire, delving into the composition of unit assemblages in relation to abandonments, it has also provided us with a research tool useful for investigating, more broadly, the dynamics and behaviours of settlement abandonments in the EC and MC periods. Given the expected high occurrence of fire destructions in the past, it would be worth extending the investigation to other periods of Cypriot prehistory and protohistory to gain a better understanding of the dynamics behind and management of these events in relation to abandonments *(e.g.*, Frankel 2022; Klinkenberg 2022, p. 300, 304; Kreimerman 2023).

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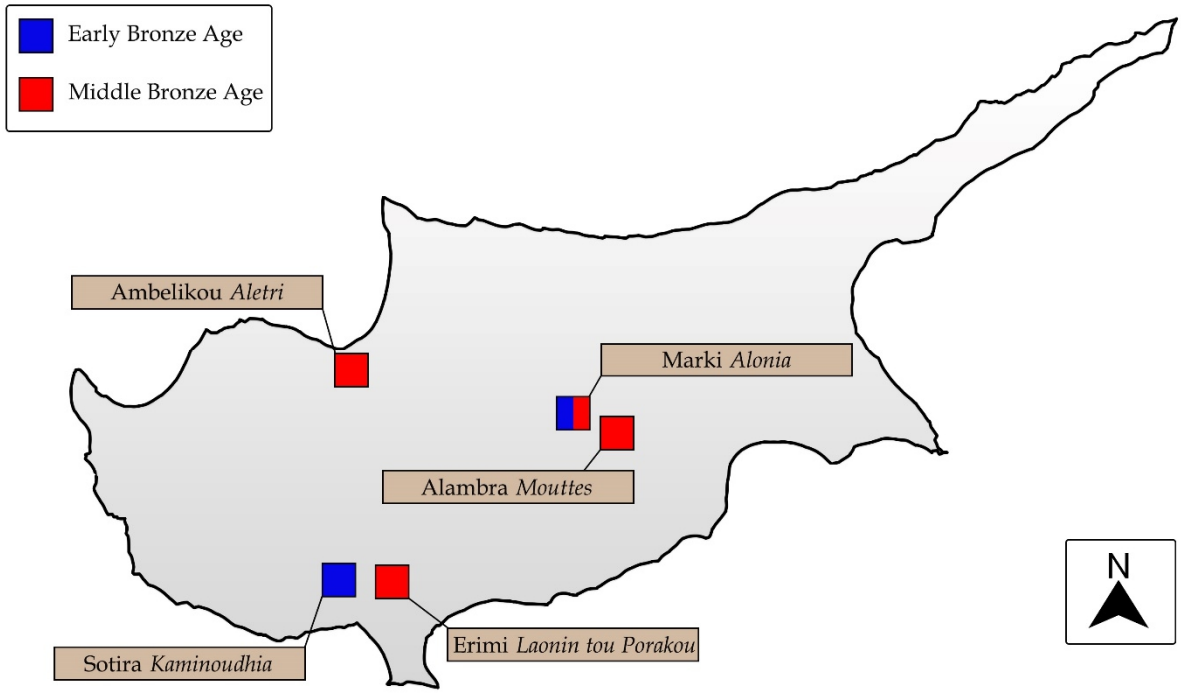


Fig. 1. Map of Cyprus and analysed sites (by the authors).
Harta Ciprului și siturile analizate (de către autori).

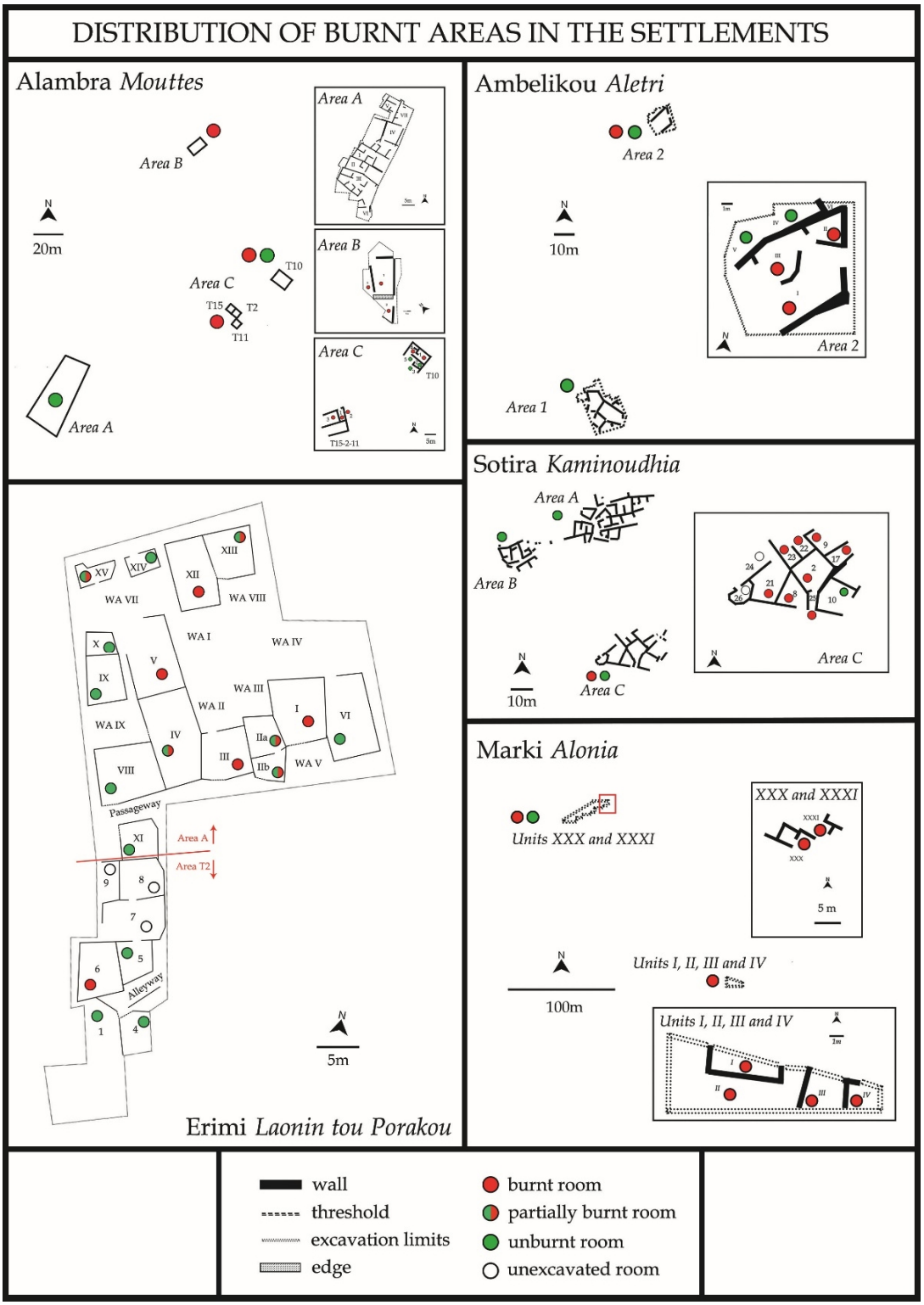


Fig. 2. Plans and location of burnt areas in the selected settlements (readapted Coleman *et alii* 1996, fig. 10; Frankel, Webb 1996, fig. 4.1, 4.38, 4.57; Swiny 2008, p. 45; Webb, Frankel 2013b, p. 30, fig. 3.6, p. 54, fig. 5.2; Sneddon *et alii* 2022, p. 3, fig. 1.3, p. 10, fig. 2.1, p. 27, fig. 2.7; courtesy Archivio della Missione Archeologica Italiana a Erimi (Cipro)/Erimi Archaeological Project).
Planurile și amplasarea suprafețelor arse în așezările selectate (readaptat după Coleman *et alii* 1996, fig. 10; Frankel, Webb 1996, fig. 4.1, 4.38, 4.57; Swiny 2008, p. 45; Webb, Frankel 2013b, p. 30, fig. 3.6, p. 54, fig. 5.2; Sneddon *et alii* 2022, p. 3, fig. 1.3, p. 10, fig. 2.1, p. 27, fig. 2.7; prin bunăvoința Archivio della Missione Archeologica Italiana a Erimi (Cipro)/Erimi Archaeological Project).

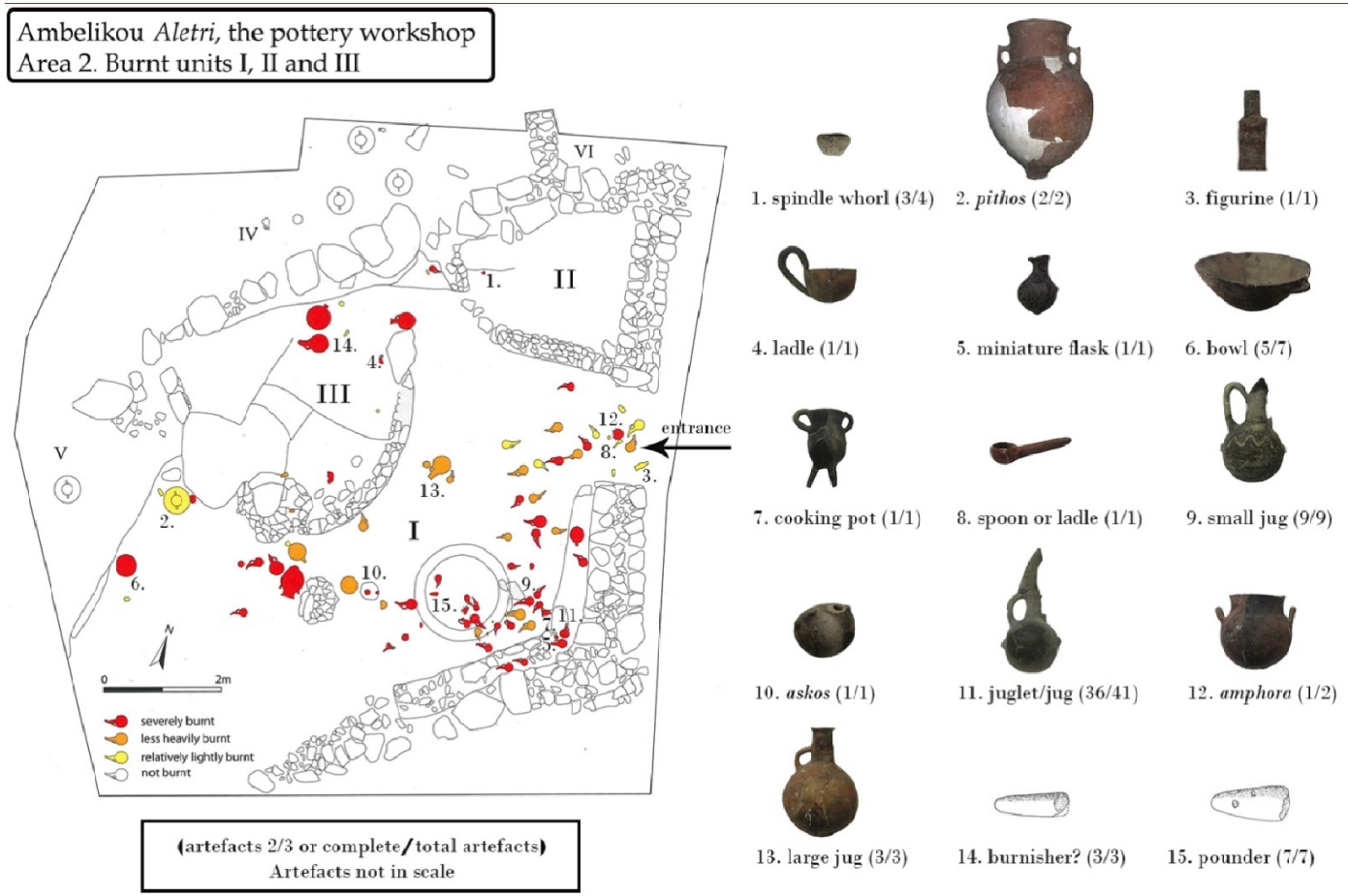


Fig. 3. Ambelikou. Distribution of artefacts discovered in the burnt rooms of area 2 (readapted Webb, Frankel 2013b, p. 67, fig. 5.27, p. 75-76, fig. 6.2-6.3, p. 81, fig. 6.12, p. 82, fig. 6.14, p. 85, fig. 6.18, p. 87-89, figs. 6.20-6.22, p. 92, fig. 6.26, p. 94-96, figs. 6.28-6.29, p. 162, fig. 7.22, p. 164, fig. 7.24, p. 170, fig. 8.3, p. 173, fig. 8.6) (Reproduced upon permission granted by Prof Webb, Prof Frankel and the Department of Antiquities, Cyprus).
Distribuția artefactelor descoperite în camerele arse din zona 2 (readaptat după Webb, Frankel 2013b, p. 67, fig. 5.27, p. 75-76, fig. 6.2-6.3, p. 81, fig. 6.12, p. 82, fig. 6.14, p. 85, fig. 6.18, p. 87-89, figs. 6.20-6.22, p. 92, fig. 6.26, p. 94-96, figs. 6.28-6.29, p. 162, fig. 7.22, p. 164, fig. 7.24, p. 170, fig. 8.3, p. 173, fig. 8.6) (Reproducere cu permisiunea acordată de Prof. Webb, Prof. Frankel și Departamentul de Antichități, Cipru).

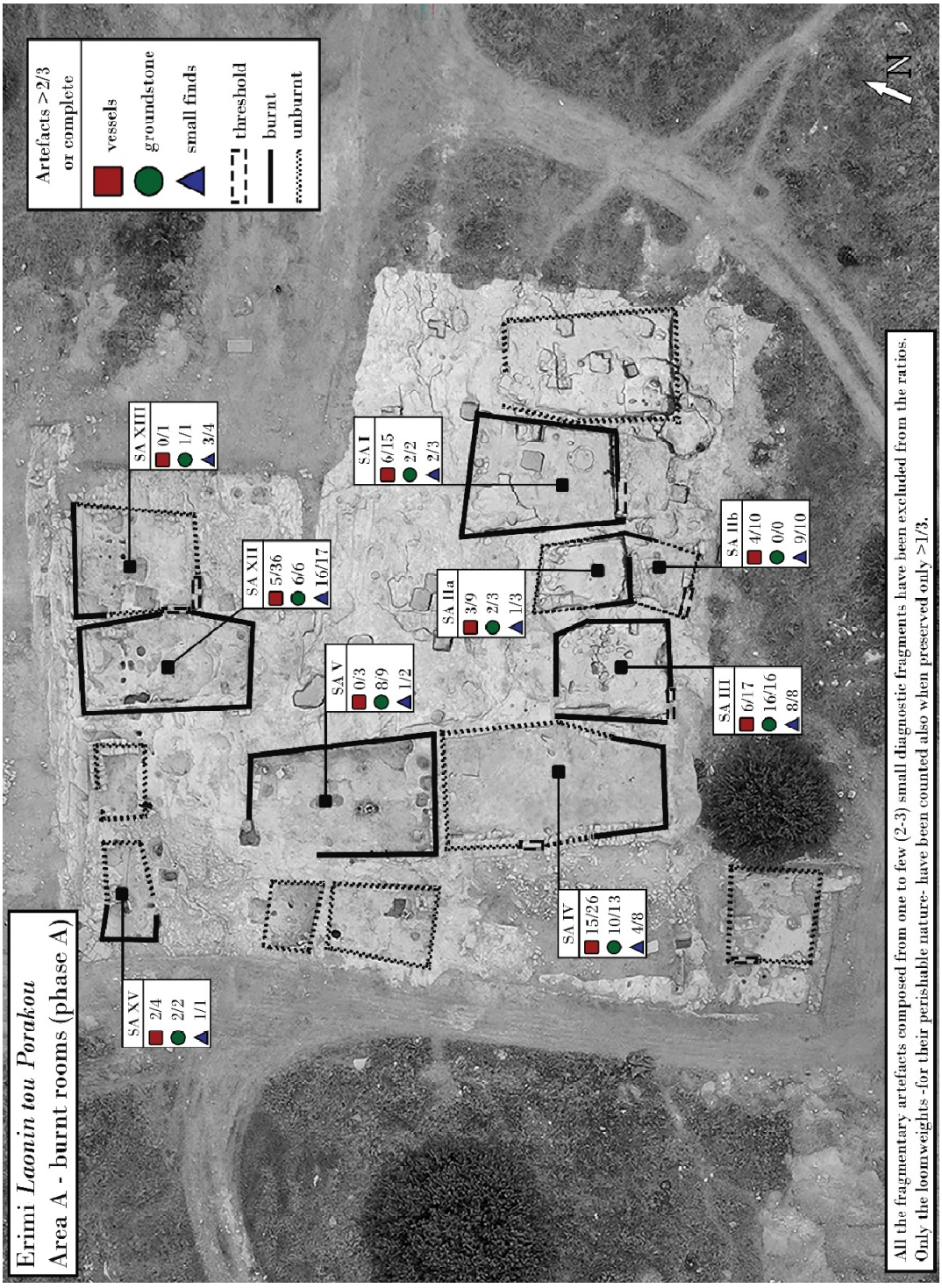


Fig. 4. Erimi. Artefact distribution in the burnt rooms of area A (by the authors).
Erimi. Distribuția artefactelor în camerele arse din zona A (autorii).

Fig. 5. Erimi, unit SA I. Distribution of the burnt layer on phase B floor (courtesy Archivio della Missione Archeologica Italiana a Erimi (Cipro)/Erimi Archaeological Project).
Erimi, unitatea SA I. Distribuția stratului ars pe podeaua din faza B (prin bunăvoința Archivio della Missione Archeologica Italiana a Erimi (Cipro)/Erimi Archaeological Project).

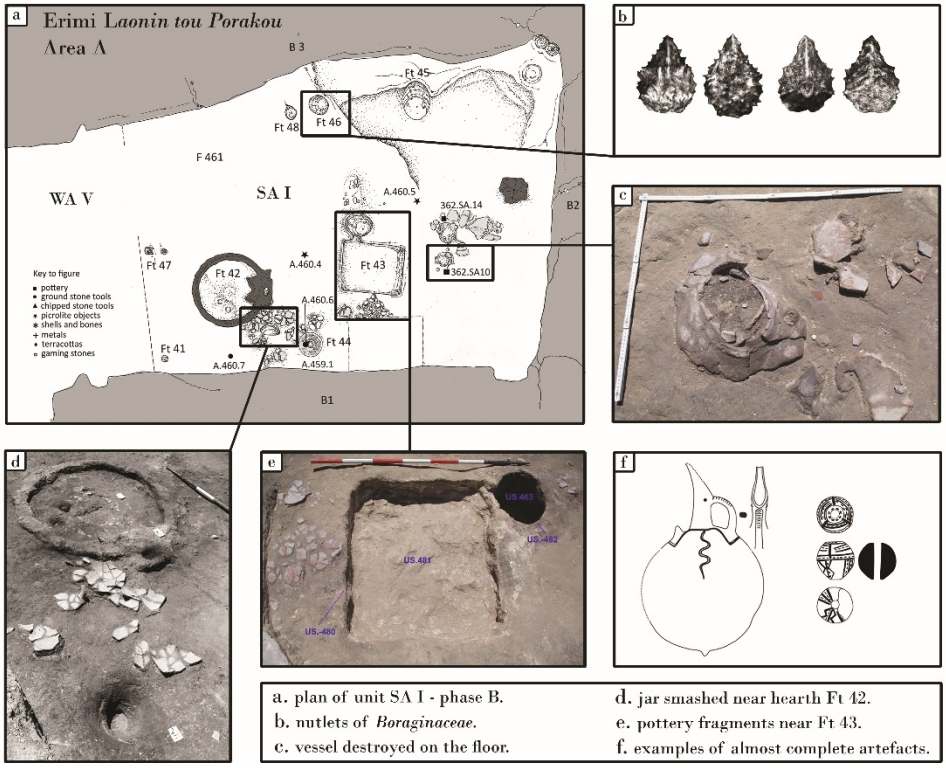
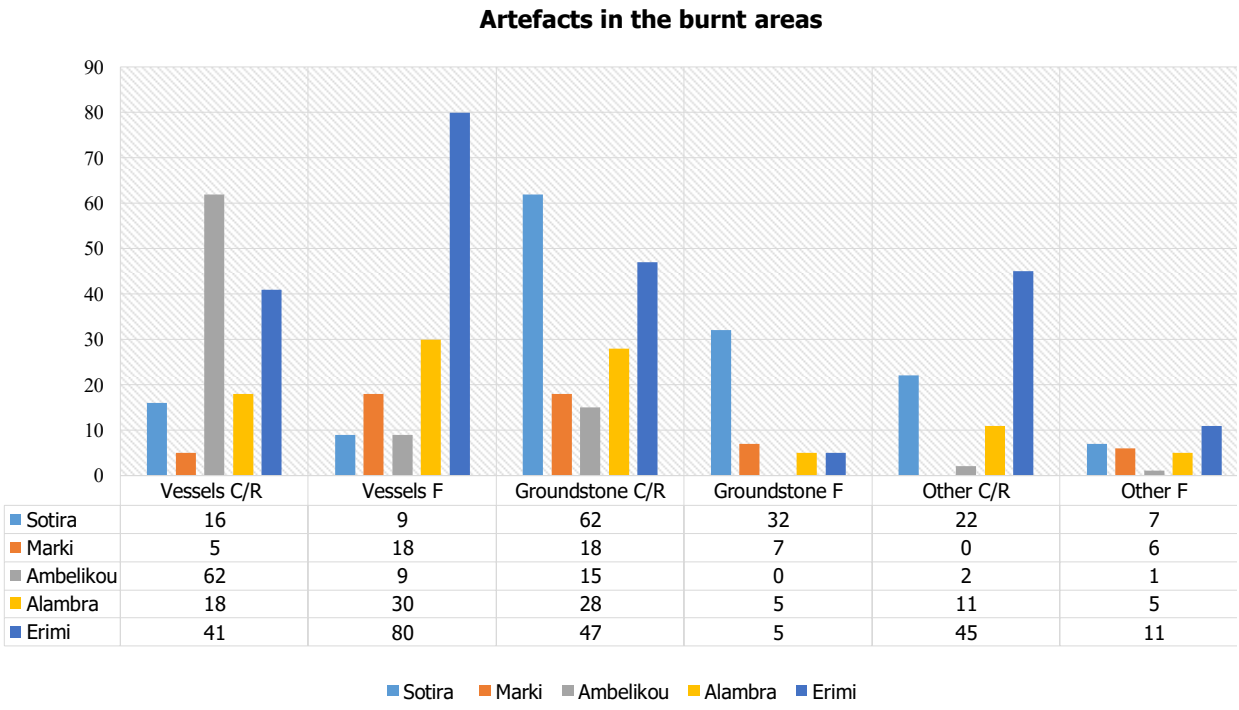


Fig. 6. Erimi, unit SA I – phase B. Markers of accidental destruction (courtesy Archivio della Missione Archeologica Italiana a Erimi (Cipro)/Erimi Archaeological Project).
Erimi, unitatea SA I – faza B. Markeri de distrugere accidentală (prin bunăvoința Archivio della Missione Archeologica Italiana a Erimi (Cipro)/Erimi Archaeological Project.



	Vessels C/R	Vessels F	Groundstone C/R	Groundstone F	Other C/R	Other F
Sotira	16	9	62	32	22	7
Marki	5	18	18	7	0	6
Ambelikou	62	9	15	0	2	1
Alambra	18	30	28	5	11	5
Erimi	41	80	47	5	45	11

Fig. 7. Bar-chart showing the artefacts distribution in the burnt areas of all the sites. The artefacts discovered in the rebuilt rooms at Marki and the grave goods from Unit 1 at Alambra are excluded (by the authors).
Diagramă care arată distribuția artefactelor în zonele arse ale tuturor siturilor. Sunt excluse artefactele descoperite în încăperile reconstruite de la Marki și obiectele funerare din Unit 1 de la Alambra (autorii).

Sotira *Unit*	***Pottery***		***Ground stone***		***Other***	
	C/R	F	C	F	C/R	F
2 (court yard)	ET: 7 DT: 0 (1 cooking, 1 amphora, 1 bowl, 1 miniature bowl, 1 tankard, 2 juglets)	2	ET: 7 DT: 5 (1 axe, 1 gaming, 1 mortar, 1 perforated disc, 3 pounders, 1 rubber-pounder, 1 rubbing, 1 stone with depression, 2 weights)	8	ET: 7 (3 spindle whorls, 1 bead, 1 bone needle with an eye, 1 worked picrolite, 1 fallow deer antler)	ET: 2 (2 awl fragments)
8	ET: 4 DT: 0 (2 jugs, 1 bowl, 1 juglet)	2	ET: 1 DT: 6 (1 rectangular slab, 1 mortar, 1 pounder, 4 rubbers)	2	ET: 2 (1 bead, 1 metal awl or chisel)	ET: 2 (1 spindle whorl, 1 worked picrolite)
9	ET: 1 DT: 0 (1 jug)	0	ET: 0 DT: 3 (1 mortar, 1 rubber-pounder, 1 function uncertain)	3	ET: 2 (1 bone point, 1 picrolite pendant)	ET: 0
17	ET: 0 DT: 0	0	ET: 3 DT: 1 (1 rubber-pounder, 3 pounders)	3	ET: 5 (1 spindle whorl, 4 stone ornaments)	ET: 1 (1 worked picrolite)
21	ET: 2 DT: 0 (1 bowl, 1 composite vessel)	0	ET: 9 DT: 6 (2 querns, 1 hammerstone, 1 mortar, 1 gaming, 8 pounders, 2 rubbers)	8	ET: 4 (1 spindle whorl, 4 bone tools)	ET: 2 (worked picrolite, TC figurine) + knapping debris
22	ET: 0 DT: 1 (1 large bowl)	3	ET: 12 DT: 4 (1 quern, 2 rubbers, 2 axes, 7 pounders, 1 hammerstone, 1 pecking stone, 1 mortar, 1 rubber-pounder)	7	ET: 1 (1 spindle whorl)	ET: 0
23*	ET: 1 DT: 0 (1 bowl)	2	ET: 2 DT: 1 (1 pounder, 1 pecking stone, 1 rubber)	0	ET: 1 (1 picrolite pendant)	ET: 0
25 (alley way)	ET: 0 DT: 0	0	ET: 1 DT: 1 (1 mortar, 1 pecking)	1	ET: 0	ET: 0

Tab. 1. Sotira *Kaminoudhia*. Artefacts in the burnt rooms (C/R = complete/restorable; F = fragmentary; ET = easy transportable; DT = difficult to transport).
Sotira *Kaminoudhia*. Artefacte din camerele arse (C/R = complet/restaurabil; F = fragmentar; ET = ușor transportabil; DT = dificil de transportat).

Marki *Unit*	*Pottery*		*Ground stone*		*Other*	
	C/R	F	C	F	C/R	F
I-1	ET: 0 DT: 0	3	ET: 1 DT: 0 (1 pounder)	0	ET: 0	ET: 0
II-1	ET: 0 DT: 0	2	ET: 1 DT: 7 (3 rubbers, 2 mortars, 2 socket stones, 1 pounder)	3	ET: 0	ET: 4 (3 spindle whorls, 1 bead)
III-1	ET: 0 DT: 0	6	ET: 1 DT: 1 (1 pounder, 1 socket stone)	0	ET: 0	ET: 0
IV-1	ET: 0 DT: 0	3	ET: 0 DT: 1 (1 mortar)	1	ET: 0	ET: 1 (1 needle)
IX-11/ IX-10	ET: 0 DT: 0	2	ET: 0 DT: 0	0	ET: 0	ET: 0
X-11/ X-10	ET: 0 DT: 0	1	ET: 0 DT: 0	0	ET: 3 (2 convex scarpers, 1 platform core)	ET: 2 (2 bone points)
XXX-1	ET: 2 DT: 0 (1 large bowl, 1 cooking pot)	1	ET: 0 DT: 1 (1 rubber)	0	ET: 0	ET: 0
XXXI-1	ET: 3 DT: 0 (1 cooking pot, 1 jug, 1 small bowl)	3	ET: 2 DT: 3 (1 weight, 2 grinders, 2 rubbers)	3	ET: 0	ET: 1 (1 zoomorphic figurine)

Tab. 2. Marki *Alonia*. Artefacts in the burnt rooms(C/R = complete/restorable; F = fragmentary; ET = easy transportable; DT = difficult to transport).
Marki *Alonia*. Artefacte din camerele arse (C/R = complet/restaurabil; F = fragmentar; ET = ușor transportabil; DT = dificil de transportat).

Ambelikou *Unit*	*Pottery*		*Ground stone*		*Other*	
	C/R	F	C	F	C/R	F
I (Area 2)	ET: 51 DT: 6 (1 amphora, 1 *askos*, 33 jugs, 3 juglets, 3 large bowls, 2 large jugs, 1 miniature flask, 2 *pithoi*, 1 cooking pot, 9 small jugs, 1 spoon)	9	ET: 10 DT: 0 (1 axe-shaped object, 1 small stone instrument, 2 burnishers, 4 pounders, 1 pounder/grinder, 1 rectangular igneous stone)	0	ET: 2 (1 bead, 1 spindle whorl)	ET: 0
II (Area 2)	ET: 0 DT: 0	0	ET: 0 DT: 0	0	ET: 0	ET: 1 (1 spindle whorl)
III (Area 2)	ET: 4 DT: 1 (2 jugs, 1 small bowl, 1 medium-size bowl, 1 large bowl)	0	ET: 5 DT: 0 (2 axe-shaped objects, 1 burnisher, 2 pounders)	0	ET: 0	ET: 0

Tab. 3. Ambelikou *Aletri*. Artefacts in the burnt rooms (C/R = complete/restorable; F = fragmentary; ET = easy transportable; DT = difficult to transport).
Ambelikou *Aletri*. Artefacte din camerele arse (C/R = complet/restaurabil; F = fragmentar; ET = ușor transportabil; DT = dificil de transportat).

Alambra *Unit*	*Pottery*		*Ground stone*		*Other*	
	C/R	F	C	F	C/R	F
I (T1; Area B)	ET: 0 DT: 0	2	ET: 0 DT: 3 (1 rubbing stone, 1 quern, 1 basin)	1	ET: 0	ET: 0
II (T1; Area B)	ET: 7 DT: 2 (2 small open vessels, 1 small bowl, 1 open vessel, 1 *pithos*, 1 large jug, 1 small jug, 1 cup, 1 shallow basin)	14	ET: 13 DT: 3 (2 pounders, 2 hammerstones/anvils, 2 hammers, 3 miscellaneous, 1 lid, 1 weight, 4 rubbing stones, 1 mortar)	0	ET: 2 (1 spindle whorl, 1 copper pin)	ET: 1 (1 copper chisel)
III (T1; Area B)	ET: 0 DT: 1 (1 large vessel)	0	ET: 0 DT: 0	0	ET: 0	ET: 0
I (T2; area C)	ET: 0 DT: 0	2	ET: 0 DT: 1 (1 rubber)	2	ET: 4 (1 copper pin, 1 lead spiral earring/s?, 2 ingots)	ET: 0
II (T11; area C)	ET: 0 DT: 0	4	ET: 1 DT: 0 (1 miscellaneous)	0	ET: 2 (2 spindle whorls)	ET: 0
III (T15; area C)	ET: 1 DT: 2 (1 small bowl, 1 large bowl, 1 large jug)	0	ET: 0 DT: 0	0	ET: 0	ET: 0
I (T10; area C)	ET: 2 DT: 1 (1 small juglet, 1 small/medium amphora, 1 large jar/*pithos*)	4	ET: 2 DT: 2 (1 rubber, 2 hammers, 1 rubbing stone)	2	ET: 1 (1 spindle whorl)	ET: 1 (1 spindle whorl)
IV (T10; area C)	ET: 1 DT: 1 (1 small bowl, 1 large open vessel)	4	ET: 1 DT: 2 (1 miscellaneous, 1 hammer, 1 mortar?)	0	ET: 5 (1 spindle whorl, 2 marine shells, 1 anthropo-morphic figure, 1 loom weight >1/3)	ET: 3 (1 pin, 1 fragment of human figure)

Tab. 4. Alambra *Mouttes*. Artefacts in the burnt rooms (C/R = complete/restorable; F = fragmentary; ET = easy transportable; DT = difficult to transport).
Alambra *Mouttes*. Artefacte din camerele arse (C/R = complet/restaurabil; F = fragmentar; ET = ușor transportabil; DT = dificil de transportat).

Erimi *Unit*	***Pottery***		***Ground stone***		***Other***	
	C/R	F	C	F	C/R	F
SA I (phase B)	ET: 1 DT: 4 (1 jug, 3 jars, 1 *pithos*)	5	ET: 2 DT: 0 (1 hammer, 1 pounder)	0	ET: 3 (1 spindle whorl, 2 picrolite cobbles)	ET: 1 (1 spindle whorl)
SA I (phase A)	ET: 5 DT: 1 (1 *pithos*, 2 juglets, 1 bowl, 1 cooking pot, 1 *pyxis*)	9	ET: 1 DT: 1 (1 hammer, 1 mortar)	0	ET: 2 (1 picrolite pendant, 1 chipped stone tool)	ET: 1 (1 spindle whorl)
SA IIa	ET: 1 DT: 2 (1 amphora, 1 bowl, 1 jug)	6	ET: 1 DT: 1 (1 quern, 1 pounder)	1	ET: 1 (1 picrolite tool)	ET: 2 (1 bronze knife, 1 picrolite plaque)
SA IIb	ET: 4 DT: 0 (2 juglets, 1 jug, 1 small amphora)	6	ET: 0 DT: 0	0	ET: 9 (6 spindle whorls, 1 picrolite pendant, 1 marine shell, 1 lithic tool)	ET: 1 (1 lithic tool)
SA III	ET: 5 DT: 1 (1 amphora, 1 *askos*, 1 bowl, 1 cooking pot, 1 jug, 1 jug/tankard)	1 1	ET: 2 DT: 14 (4 querns, 1 pounder, 10 rubbers, 1 pecking stone)	0	ET: 8 (1 spindle whorl, 3 loom weights, 4 loom weights >1/3)	ET: 0
SA IV	ET: 5 DT: 10 (1 amphora, 1 amphora/jar, 6 bowls, 1 cooking pot, 1 jar, 4 jugs, 1 *pithos*). *4 complete piled in front of the door	1 1	ET: 5 DT: 5 (2 pounders, 1 rubber, 1 anvil, 1 axe, 3 weights, 1 gaming, 1 hammer/pounder)	3	ET: 4 (2 spindle whorls, 2 picrolite cobbles)	ET: 4 (2 spindle whorls, 2 marine shells)
SA V	ET: 0 DT: 0	3	ET: 3 DT: 5 (1 quern, 1 pecking, 1 anvil, 1 hammer, 4 weights)	1	ET: 1 (1 spindle whorl)	ET: 1 (1 spindle whorl)
SA XII	ET: 2 DT: 3 (1 amphora, 1 bowl, 1 juglet, 1 pan, 1 *pithos*)	3 1	ET: 1 DT: 5 (1 quern, 1 rubber, 1 mortar, 2 weights, 1 grinder)	0	ET: 16 (1 bronze knife, 6 spindle whorls, 4 loom weights, 2 loom weights >1/3, 1 picrolite pendant, 1 picrolite, 1 perforated stone chalk)	ET: 1 (1 spindle whorl)
SA XIII	ET: 0 DT: 0	1	ET: 0 DT: 1(1 rubber)	0	ET: 3 (1 bronze knife, 2 picrolites)	ET: 1 (1 picrolite)
SA XV	ET: 2 DT: 0 (1 jug, 1 bowl)	2	ET: 0 DT: 2 (1 quern, 1 mortar)	0	ET: 1 (1 spindle whorl)	ET: 0

Tab. 5. Erimi *Laonin tou Porakou*. Artefacts in the burnt rooms (C/R = complete/restorable; F = fragmentary; ET = easy transportable; DT = difficult to transport).
Erimi *Laonin tou Porakou*. Artefacte din camerele arse (C/R = complet/restaurabil; F = fragmentar; ET = ușor transportabil; DT = dificil de transportat).

Braconajul arheologic sau decontextualizarea și pierderea informației istorice. Studiu de caz: artefacte preistorice recuperate prin activitatea autorităților judiciare

Claudiu PURDEA*

Abstract: *The artifacts recovered by judicial authorities following investigations into criminal activities at archaeological sites in Transylvania and Dobrogea have reached impressive numbers. Among these, coins constitute the largest proportion, reflecting the high demand for these artefacts. Nonetheless, among the confiscated archaeological objects were also lithic and ceramic artifacts, pieces that further attest to the extensive scope that criminality has attained.*

This study aims to draw the attention of the scientific community to a set of five exceptional items, a stone axe head, a stone adze, a flint core, an anthropomorphic figurine made of clay, and a sea-urchin fossil – Echinoidea, Clypeaster, whose legal statuses are not uniform. The primary objective of this work is not merely the cataloguing and typological classification of these cultural assets but rather the presentation of the phenomenon and the trajectory these objects have taken, following their extraction from the primary context, to their deposition in a museum, where they were placed by the authorities after the establishment of their legal regime.

Rezumat: *Artefactele recuperate de autoritățile judiciare în urma investigării activităților infracționale desfășurate în siturile arheologice din Transilvania și Dobrogea ating cifre impresionante. Dintre acestea, cea mai ridicată pondere o au monedele, dat fiind interesul ridicat pentru aceste piese, însă printre acestea au fost ridicate în vederea confiscării și artefacte litice ori din ceramică, piese care dovedesc încă o dată amploarea pe care infracționalitatea a cunoscut-o. Prin acest studiu se aduce în atenția cercetării științifice un număr de cinci piese excepționale (un cap de topor din piatră, o teslă din piatră, un nucleu de silex, o statuetă antropomorfă din lut și o fosilă – Echinoidea, Clypeaster), al căror statut juridic nu este unitar. Obiectivul principal al acestui demers nu este neapărat catalogarea și încadrarea tipologică a bunurilor culturale amintite, ci a prezentării fenomenului și a circuitului pe care l-au avut, de la extragerea din sol, din contextul lor inițial, până la depozitul instituției muzeale, acolo unde au fost depuse de autorități după stabilirea regimului juridic.*

Keywords: *Axe head, anthropomorphic figurine, archaeological looting, cultural heritage*

Cuvinte-cheie: *Cap de topor, statuetă antropomorfă, braconaj arheologic, patrimoniul cultural*

◈ Introducere

Braconajul arheologic este un fenomen infracțional prin care integritatea patrimoniului arheologic a fost grav afectată și care nu a fost în totalitate eradicat de către statul român. În cea mai înfloritoare perioadă pe care acest flagel a cunoscut-o, siturile arheologice au fost luate cu asalt de cei care dețineau aparate pentru detecția de metale și investigate pentru a fi identificate „comori fabuloase", după cum își imaginau cei care practicau asemenea activități. Nu în puține cazuri, mai ales din siturile în care era cunoscut faptul că au fost identificate

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tezaure, infractorii au putut fura nestingheriți bunuri aflate și acum în urmărire de către autoritățile române și INTERPOL. Monede sau emisiuni din metale prețioase de numărul miilor au fost traficate pe piața internațională a antichităților, dintre care s-a putut recupera doar o mică parte. De asemenea, elemente de orfevrărie ori piese cu rol apotropaic (dacă acceptăm ideea că spiralele dacice nu au fost destinate portului), au avut aceeași soartă. În același timp, alături de bunurile culturale, și cele paleontologice au beneficiat de interes din partea filierelor ce se ocupau cu traficarea patrimoniului cultural și natural.

Însă, pe lângă aceste bunuri, autoritățile au ridicat în timpul percheziților domiciliare și câteva piese a căror identificare ridică semne de întrebare, deoarece nu se încadrează în categoria celor confecționate din metal. În această situație se află toate cele cinci piese pe care le voi prezenta mai jos.

◈ Descoperitori și regimul juridic

Dată fiind proveniența pieselor prezentate se impun câteva detalii referitoare la persoanele de la care au fost ridicate și preocupările pe care le aveau. În mediul comerțului cu antichități există o ierarhie care a fost atent observată și publicată de Barbara Deppert-Lippitz în anul 2009. Specialista germană observa atunci că intermediarii au un rol deosebit de important, deoarece ei sunt cei care intră primii în contact cu bunurile furate din siturile arheologice și totodată cei care le cunosc foarte bine valoarea economică. Astfel, ei sunt cei care își asumă riscurile achiziției bunurilor provenite din activitățile ilicite, a căror origine o spală prin diverse metode (colete trimise spre SUA, vânzări prin firme paravan), iar artefactele le valorifică la prețul real al pieței. De regulă acest proces se desfășoară în timp, iar diferența dintre prețul plătit descoperitorului ori braconierului și cel al vânzării finale, este uriașă. Spre exemplu, o *phiala* din aur a fost vândută după 11 ani cu suma de 1,2 milioane $, față de 20.000 $, cât a fost prețul de achiziție (Deppert-Lippitz 2009, p. 138).

Zonele paradis pentru comerțul cu antichități sunt fără dubiu cele unde există patrimoniu deosebit de cunoscut și căutat de colecționari: Egipt, Persia, Grecia, Italia, America Latină etc., însă și fostele teritorii locuite de triburile celtice, germanice, scitice ori dacice, ale căror preocupări pentru tezaurizarea metalului prețios și modul în care se realiza aceasta, sunt cunoscute în lumea colecționarilor. Numai prin această relație de cerere - ofertă pot fi explicate acțiunile de braconaj arheologic în siturile din fostele provincii ale Imperiului roman ori teritoriile locuite de triburile amintite. Activitatea autorităților judiciare ne-a arătat că tezaurele monetare ori orfevro-monetare furate din siturile arheologice din Munții Șureanu aveau greutăți cuprinse între 10,2 și peste 30,6 kg (Oberländer-Târnoveanu 2013; Lazăr 2020, p. 136-137). Este de înțeles că astfel de descoperiri au aprins imaginația tuturor localnicilor, unii rămași fără locuri de muncă, într-o perioadă de tranziție în care activitatea de muncitori în domeniul silviculturii părea să fie singura preocupare. În același timp, lumea interlopă din Deva nu putea rămâne indiferentă la noua oportunitate de îmbogățire, mai ales că membrii ei aduceau și comercializau detectoarele de metale și tot aceștia cunoșteau și aveau acces la filierele prin care se puteau comercializa bunurile descoperite. Dorința puternică, echivalată cu sindromul „Indiana Jones", a condus la apariția unor braconieri care vizau siturile de mai mică importanță, locuri în care se întâlneau cu bunuri din metale neprețioase (bronz, cupru, fier), care nu erau la mare căutare printre colecționari sau nu aveau o valoare economică ridicată. Aceștia, fără o „cultură a artefactelor" culegeau de pe teren absolut tot, chiar dacă în unele cazuri erau doar fragmente ceramice (fig. 1), pe care, neputându-le vinde, le păstrau ca

suveniruri. Ulterior, aceste „amintiri de la fața locului" au fost identificate de autoritățile judiciare în cadrul percheziților domiciliare.

Treptat, în acest tablou își fac apariția și intermediarii, care nu aveau acces la piese din metale prețioase, dar se ocupau cu achiziția unor loturi mari culese de braconierii mărunți ori descoperitorii ocazionali. Deși piese arheologice autentice, prețul unor componente de echipament militar roman, ori al unor elemente de podoabă și port nu este același cu al unei monede, sau nu era perceput astfel în perioada anilor 1998-2004, când bunurile se vindeau în târgurile de vechituri pe loturi. Cum nu le puteau valorifica rapid, acești comercianți au ajuns să dețină adevărate depozite ori „aglomerări" de bunuri (impropriu denumite colecții), pe care le păstrau cu gândul la creșterea prețului ori interesului pe piața de profil. Relațiile „profesionale" între aceștia și braconieri erau active și altfel se explică identificarea lor de către autoritățile judiciare în timpul anchetei din dosarul „Aurului Dacic". Astfel, în timpul percheziților domiciliare din dosarul penal nr. 151/P/2005 al Parchetului de pe lângă Curtea de Apel Alba Iulia, au fost indisponibilizate 11250 bunuri arheologice, dintre care 5304 numismatice. Un astfel de exemplu este R.H.C., care, în anul 2006 a înaintat câteva oferte către Muzeul Național al Transilvaniei din Cluj-Napoca, iar în 2007, după începerea urmăririi penale, pentru a înlătura produsul infracțiunii și a beneficia de clauza de impunitate prevăzută de lege, a donat aceleiași instituții muzeale 4105 artefacte, ce au fost sustrase din siturile arheologice din Transilvania, Banat și Dobrogea (Purdea 2024a, p. 483). Este ilustrativă situația intermediarului, care făcea periodic deplasări pe cuprinsul țării pentru a colecta marfa. De asemenea, un caz similar, dar la scară mai redusă este S.N., de la care autoritățile judiciare au ridicat în timpul percheziției domiciliare din anul 2005 un aparat pentru detecția de metale (deținut fără autorizație) și 269 bunuri din categoria patrimoniului arheologic (monede, elemente de podoabă și port, ceramică, unelte, arme etc.), între care și patru dintre piesele ce fac obiectul studiului de față (toporul/teslă, statueta antropomorfă, nucleul de silex și fosila).

S.N. a fost scos de sub urmărire penală, iar statul a depus o acțiune în revendicare mobiliară, prin care a solicitat instanței civile obligativitatea lăsării bunurilor ridicate de autorități, în deplină proprietate și liniștită posesie Ministerului Culturii. Astfel, prin sentința nr. 1519/2017 în dosarul civil nr. 2099/97/2009, instanța a admis acțiunea și a dispus ca cele 269 artefacte să rămână în proprietatea statului. Întrucât nu era definitivă, hotărârea a fost atacată cu recurs, iar instanța superioară a respins recursul ca nefiind fondat. Deși își atribuie calitatea de colecționar, arată în declarația de la Parchet că nu a fost preocupat să dobândească statutul legal impus de lege. Pentru acuratețea informațiilor redau mai jos citatul din a doua declarație. În completarea lor mai trebuie adăugat și faptul că S.N. mai avea în locuință și mai multe tablouri, cărți, mașini de cusut, instrumente muzicale, artă decorativă care dovedesc, într-adevăr, faptul că făcea comerț cu obiecte vechi, însă bunurile arheologice aveau regim special, iar în conformitate cu prevederile legii nu puteau fi deținute de persoane fizice, cu excepția cazului în care au fost achiziționate de la operatori economici autorizați (vezi întreaga argumentație la Purdea 2024b). Ba mai mult, în locuință a fost descoperit și un detector de metale (White's 3900 D PRO+), neînregistrat, despre care S.N. a declarat că l-a achiziționat din târgul de la Brașov în anul 2004 pentru suma de 200 €. În declarațiile ulterioare percheziției a menționat că acest aparat a fost utilizat o singură dată, fără succes, întrucât nu știa să-l folosească. Cercetări științifice ulterioare subliniază că în anul 2018 au fost identificate și alte bunuri arheologice în locuința aceleiași persoane (Ciută 2018; 2019).

Cr.I. era localnic de pe Valea Grădiștii, fiind cunoscut autorităților pentru faptul că efectua detecții în siturile arheologice, ori aduna uneltele abandonate de braconieri pe marginea gropilor și încerca să le valorifice. În anul 2004 a predat astfel de piese și instituțiilor

muzeale, declarând că le-a descoperit întâmplător. În același timp oferea cazare și îndeplinea rolul de călăuză pentru braconieri, furnizând bunuri arheologice lui R.H.C., mai sus amintit, fapt pentru care a fost cercetat penal în anii 2004 și 2006. În acest context s-a efectuat o percheziție domiciliară, în cadrul căreia a fost identificat și ridicat toporul din piatră cu perforație, împreună cu alte artefacte. Expertiza preliminară efectuată a relevat că bunul este unul cert arheologic, întrunind criteriile pentru includerea lui prin clasare în patrimoniul cultural național, fără a fi precizată însă categoria. Apoi, în anul 2015 s-a dispus începerea urmăririi penale pentru implicarea lui într-o filieră de trafic cu artefacte și săvârșirea infracțiunilor de spălare de bani și furt calificat și fiind efectuată o nouă percheziție domiciliară a mai fost ridicat un topor dacic, însă procurorul a decis în urma administrării probelor să restituie bunurile și să nu înainteze cauza instanței.

La finalul acestei prezentări, trebuie menționat de asemenea, că interesul braconierilor s-a îndreptat de la început către siturile arheologice, acolo unde știau că se află bunuri, iar pentru a-și îmbogăți cunoștințele se documentau din publicațiile științifice.

◈ Discuții

Bunurile ridicate de autorități și ajunse în custodia instituțiilor muzeale sunt confecționate din piatră ori lut, astfel că identificarea acestora cu detectorul de metale este posibilă doar în situația în care concentrația de minereu ar fi substanțială. Nu am făcut un astfel de experiment, însă este puțin probabil ca ele să fi fost astfel descoperite. Mai degrabă, pe durata utilizării detectoarelor de metale, activitate ce presupune deplasarea în teren, aceste piese au fost găsite la suprafața solului în siturile arheologice, ori zonele cu potențial arheologic reperat și cunoscut sau necunoscut. Această situație este verosimilă în cazul lotului ridicat de la S.N., acolo unde se observă amestecul de artefacte din diferite epoci istorice (preistorie, antichitate, epoca migrațiilor, Evul mediu și perioada modernă). În cele ce urmează voi prezenta caracteristicile tehnice ale pieselor:

1. Cap de topor din piatră cu perforație: 196 g; înălțime = 87,38 mm; lățime tăiș = 34,42 mm; diametru orificiu = 15,50 x 15,56 mm; lățime muchie = 31,84 mm (fig. 3);
2. Cap de topor fără perforație sau teslă: 193 g, lungime = 123,76 mm; lățime = 51,29 mm (fig. 4);
3. Fosilă – Echinoidea, Clypeaster: 52,12 g; înălțime = 28,49 mm; diametru bază = 39,48 x 31,18 mm (fig. 5);
4. Nucleu de silex; 89,66 g; înălțime = 38,15 mm; diametru bază = 48,60 x 42,14 mm (fig. 6);
5. Statuetă antropomorfă fragmentară: 152 g, înălțime = 182,10 mm; diametru bază = 45,12 mm; diametru în zona rupturii = 34,55 mm (fig. 7).

Situația toporului cu gaură de înmănușare (fig. 3) este asemănătoare, însă arealul în care Cr.I. utiliza detectorul de metale era zona Munților Orăștiei, el fiind localnic din Grădiștea de Munte. Bunurile care i-au fost ridicate de autorități sunt specifice zonei (monede din perioada romană ori austriacă, o unealtă dacică, o piesă de armament), singura excepție constituind-o piesa în discuție. În literatura de specialitate acest tip de artefact a fost încadrat în categoria topoarelor-ciocan (Roska 1928, p. 28; Comșa 1987, p. 44), atribuite comunităților neolitice și celor din epoca bronzului (Comșa 1972, p. 250; Comșa 1987, p. 91; Bobi, Apostu 1997, p. 33-38; Ciugudean 2000, p. 30-31; Diaconu 2010, p. 6-7), însă în arealul Munților

Șureanu semnalarea unor astfel de piese este rară. Deși Repertoriul arheologic al județului Hunedoara nu amintește astfel de piese, în publicațiile mai vechi sunt menționate două topoare de luptă din serpentinit la Grădiștea de Munte și încă unul fragmentar (cu orificiu de fixare) în exteriorul fortificației de la Sarmizegetusa Regia din amfibolit.

De asemenea, potențialul preistoric al zonei a fost pus în evidență printr-o serie de descoperiri atât anterioare, cât și ulterioare publicării repertoriului menționat. Primul dintre ele, în 1933 menționa o măciucă din piatră cvadrilobată la Grădiștea de Munte (Schroller 1933, p. 66; Roska 1942, p. 99-100; Gogâltan, Ignat 2011, p. 11, 13), apoi în 1949 în cetatea dacică de la Alun *Piatra Roșie* erau semnalate un topor fragmentar din diorit și ceramică preistorică (Daicoviciu 1954, p. 81, planșa 13/10 – toporul din piatră, p. 96-98, planșa 17 – ceramica), iar în timpul cercetărilor din perioada 2014-2018, efectuate în proximitatea acesteia au fost identificate 34 piese litice (nuclee de silex, așchii și două gratoire) atribuite culturii Coțofeni (Barbu, Ferencz 2023, p. 36-37). Și la Ocolișu Mic (Bărbat *et alii* 2019, p. 105-109) au fost realizate cercetări în perioada 2018-2019, rezultate cu artefacte preistorice (piese litice și ceramică).

Ținând cont de aceste aspecte, nu este exclus, ba chiar există o mare probabilitate, ca toporul cu orificiu de înmănușare să provină din arealul localității Grădiștea de Munte, zonă în care locuia descoperitorul și în care își desfășura activitatea.

În privința lotului ridicat de la S.N. (fig. 2) este imposibil de reconstituit proveniența exactă a bunurilor, pentru că așa cum am spus, el colecta astfel de piese de la mai mulți braconieri, iar artefactele se eșalonează pe mai multe perioade istorice (de la preistorie la epoca modernă). Din declarația personală depusă la dosar, reiese că bunurile au fost cumpărate de la târgurile de vechituri din Alba Iulia și Brașov ori de la persoane care se ocupau cu vânzarea unor obiecte vechi. De altfel, a făcut dovada în fața autorităților judiciare că deține o autorizație pentru persoană fizică autorizată pentru comerț. În cazul statuetei și a toporului-teslă acesta precizează că le-a achiziționat din piața orașului Alba Iulia, de la o persoană necunoscută. Tot în această declarație menționează „două obiecte de formă sferică din piatră, cel mic [fosila n.m.] cumpărat din zona localității Turdaș (HD n.m.) și cel mare [nucleul de silex n.m.] din satul Ghirbom (AB n.m.). Acestea sunt datele privind proveniența bunurilor, pe care le-am putut obține din documentele autorităților judiciare.

Referitor la ipoteza potrivit căreia statueta antropomorfă și toporul de piatră ar fi fost achiziționate din piața orașului Alba Iulia, menționată în declarația citată mai sus, trebuie să îi acordăm credibilitate, tocmai ținând seama de un caz similar, deja semnalat în literatura de specialitate, în care erau vândute în aceeași piață piese din Epoca Bronzului și arme dacice (Borangic 2009, p. 49 cf. Purdea 2024a, p. 145). Astfel că nu este exclus ca aceeași persoană să fi vândut nu numai piese metalice, ci și unele din alte materiale .

În privința încadrării tipologice și a datării, statueta antropomorfă (fig. 6) se încadrează în categoria celor de tip coloană (reprezentări feminine), așa cum sunt ele definite în literatura de specialitate (Comșa 1995, p. 33; Ileș 2108, p. 124), decorată cu incizii oblice în zona gâtului și a șoldurilor, cu evidențierea sânilor și a feselor (Müller-Karpe 1968, p. 298, Taf. 181/15, 38, 42, 47; Höckmann 1968, p. 50-67; Ciută, Florescu 2010, p. 86). Capul statuetei, posibil unul triunghiular, asemenea celor întâlnite la figurinele culturilor Vinča și Turdaș, este rupt din vechime (Vasić 1936, p. 115; Roska 1941, p. 322, pl. 139). Dată fiind apropierea dintre exemplarele din mediul vincian sau din cel turdășean cu statueta recuperată de autorități, însă ținând seama de inexistența contextului arheologic, propun atribuirea ei acestor medii culturale. Am remarcat de asemenea, prezența unor amprente digitale pe una din laturile statuetei (fig. 6/f), care la o primă examinare macroscopică ar putea indica finisarea/manipularea statuetei de către o persoană adultă. Analogii atât pentru tipul de statuetă, cât și decorul incizat au fost identificate atât în

bazinul Mureșului (Roska 1941, p. 31-32; Luca 2001, p. 80-82; Luca 2014, p. 34; Luca 2016, p. 53-54; Suciu 2016, p. 158; Ștefan 2016, p. 55; Spiridon 2024, p. 14-16), cât și în Banat (Lazarovici 1979, p. 87-100; Lazarovici 2021, p. 51).

Toporul fără orificiu de înmănușare (fig. 4), denumit în literatura de specialitate și topor-teslă este întâlnit de la comunitățile neolitice până în Epoca Bronzului (Antonović 2003, p. 54-55; Joanović 2003, p. 34-48). Aceste piese au formă dreptunghiulară, trapezoidală și cvasi-simetrică, fiind bine șlefuite pe toate suprafețele (Pâclișan 2018, p. 9). Totuși, spre deosebire de cele din situl de la Alba Iulia *Lumea Nouă*, publicate exhaustiv, exemplarul descris de mine nu are fețele perfect lustruite, ci prezintă diferențe de nivel pe fiecare latură (mai pronunțate în cazul uneia dintre ele), ceea ce ar presupune cioplirea materialului înainte de a fi șlefuit. Tăișul are în profil forma literei V, iar în plan drept este ușor arcuit și ciobit în mai multe locuri. Aceste deteriorări ale piesei au rezultat cel mai probabil în urma utilizării.

Fosila (fig. 5) reprezintă cel mai atipic obiect din întreg lotul analizat. Dacă la început o suspectam ca fiind o simplă piatră, mi-am schimbat opinia, după ce am analizat decorul exterior, dispus pe 75% din suprafața piesei. Se observă că acesta este format din șiruri de puncte incizate, dispuse câte două (în cinci registre, cu dispunere în formă de stea) și două linii în zig-zag (sau cel puțin așa păreau înainte de scanarea 3D). Acest tip ornamental este un pattern specific nevertebratelor fosile din genul Clypeaster clasa Echinoidea (ariciul de mare). Din păcate, date fiind condițiile în care a fost obținută nu vom ști niciodată dacă ea provine din siturile arheologice aflate pe teritoriul localității Turdaș (județul Hunedoara) sau din proximitatea acestora.

Nucleul de silex (fig. 7) prezintă mici urme de decorticare pe una din laturi, fiind probabil abandonat sau utilizat cu rol secundar (percutor?). Culoarea silexului este cenușie cu pete fumurii. Alte observații nu se pot face în acest moment. La Ghirbom (comuna Berghin, jud. Alba), locul declarat de proveniență al nucleului sunt cunoscute opt situri arheologice, cu descoperiri din preistorie până în epoca migrațiilor (Aldea 1972; Aldea 1975; Aldea *et alii* 1979, p. 259). Astfel, informația referitoare la probabilitatea zonei de descoperire devine plauzibilă.

Ambele rapoarte de expertiză efectuate asupra bunurilor au relevat că atât statueta antropomorfă, cât și toporul-teslă, nucleul de silex și fosila (!) sunt piese arheologice, clasabile în categoria tezaur, respectiv fond. Prejudiciul evaluat pentru aceste piese era de 380 € în 2005 și de 266 € în 2011, în cea de-a doua expertiză fiind modificată valoarea de piață pentru toporul-teslă, nucleul de silex și fosila, care erau propuse pentru includere în categoria juridică fond, nu tezaur cum au fost propuse inițial.

◈ Concluzii

Valorificarea științifică a unor piese recuperate de autoritățile judiciare în timpul cercetării penale este, în opinia mea, imperioasă, pentru că în acest fel se acordă o șansă cunoașterii lor și includerii în patrimoniul cultural național. Expertizarea și clasarea acestor bunuri trebuie să reprezinte o prioritate pentru instituțiile Statului Român, însă de la sentința instanței de judecată până la efectuarea acestui deziderat este uneori o cale extrem de anevoioasă.

Din păcate, în afară de informații privind tipologia și încadrarea cronologică/culturală a pieselor prezentate nu am putut oferi decât date lacunare despre locurile de proveniență. Fără îndoială că acestea sunt zone cu potențial arheologic, unele posibil situri arheologice cunoscute (așa cum este cel de la Turdaș), însă nu am reușit să obțin mai mult. Atât prin această analiză, cât și prin întreaga cercetare a infracționalității patrimoniului cultural, domeniu de

care m-am ocupat îndeaproape, am remarcat că deținătorii bunurilor sunt secretoși și totodată evazivi în privința proveniențeі bunurilor. Probabil că această atitudine se datorează vinovăției de care sunt conștienți atunci când tăinuiesc și comercializează artefactele, respectiv obiectele paleontologice, care de drept sunt proprietatea Statului Român.

◈ Mulțumiri

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Fig. 1. Fragmente ceramice ridicate de autoritățile judiciare de la N.I.F. în anul 2000, apud dos. pen. nr. 45/P/2005, vol. III, f. 349.
Pottery fragments seized by the judicial authorities from N.I.F. in the year 2000, apud dos. pen. nr. 45/P/2005, vol. III, f. 349.

Fig. 2. Artefacte ridicate de la S.N. în anul 2005, apud revista Dacia Magazin (nr. 57/2009), cu prelucrarea proprie a fundalului și marcarea celor utilizate în acest studiu (1 – topor-teslă; 2 – statuetă antropomorfă; 3 – fosilă Echinoidea (Clypeaster); 4 – nucleu de silex).
Artifacts seized from S.N. in the year 2005, apud Dacia Magazin (no. 57/2009); own background processing and marking of artifacts presented in this study (1 – axe-adze; 2 – anthropomorphic figurine; 3 – fossil Echinoidea (Clypeaster); 4 – flint core).

Fig. 3. Topor-ciocan din piatră ridicat de autoritățile judiciare de la Cr.I. în anul 2004. Foto și prelucrare proprie 2021.
Stone axe-hammer seized by the judicial authorities from Cr.I. in the year 2004; photography and personal editing 2021.

Fig. 4. Topor-teslă din piatră ridicat de autoritățile judiciare de la S.N. în anul 2005. Foto și prelucrare proprie 2021.
Stone axe-adze seized by the judicial authorities from S.N. in the year 2005; photography and personal editing 2021.

Fig. 5. Fosila – Echinoidea (Clypeaster) ridicată de autoritățile judiciare de la S.N. în anul 2005. Foto și prelucrare proprie 2021; scanare Călin Șuteu 2025; analogie apud Birmingham Museums Trust.
Fossil – Echinoidea (Clypeaster), seized by the judicial authorities from S.N. in the year 2005; photography and personal editing 2021; scanning by Călin Șuteu 2025; analogy apud Birmingham Museums Trust.

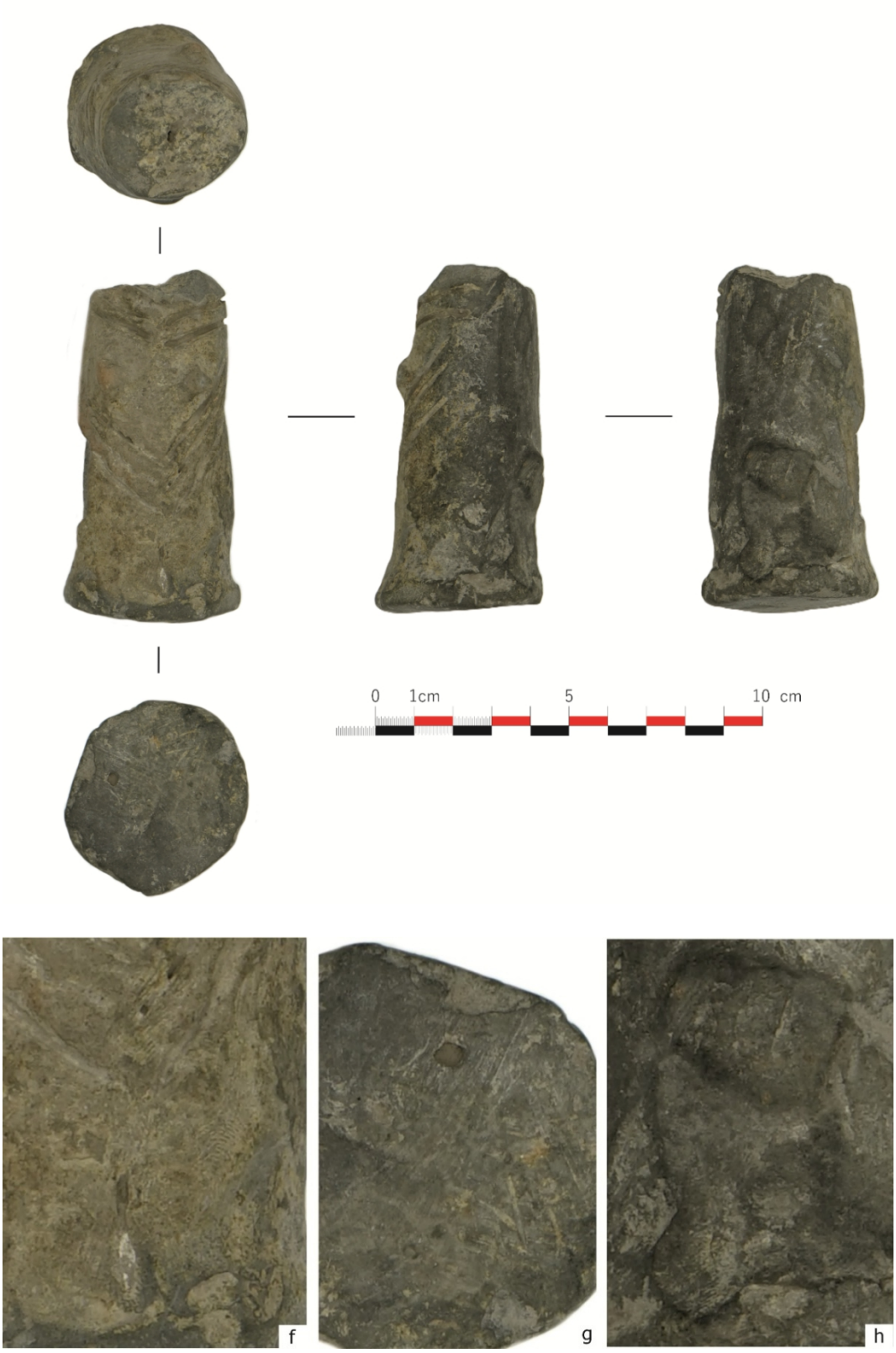

Fig. 6. Statuetă antropomorfă fragmentară ridicată de autoritățile judiciare de la S.N. în anul 2005; f-h – detalii cu amprente papilare și zgârieturi aflate pe suprafața piesei. Foto și prelucrare proprie 2021.
Fragmentary anthropomorphic figurine seized by the judicial authorities from S.N. in the year 2005; f-h – details with papillary impressions and scratches on the surface of the artefact; photography and personal editing 2021.

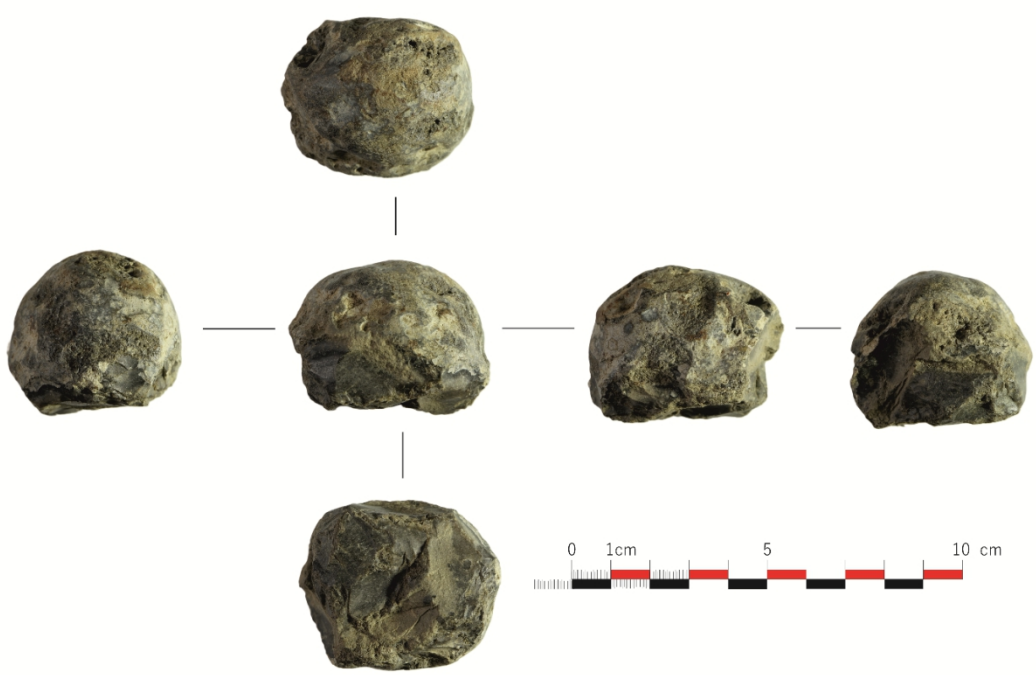

Fig. 7. Nucleu de silex ridicat de autoritățile judiciare de la S.N. în anul 2005. Foto și prelucrare proprie 2021.
Flint core seized by the judicial authorities from S.N. in the year 2005; Photo and personal editing 2021.

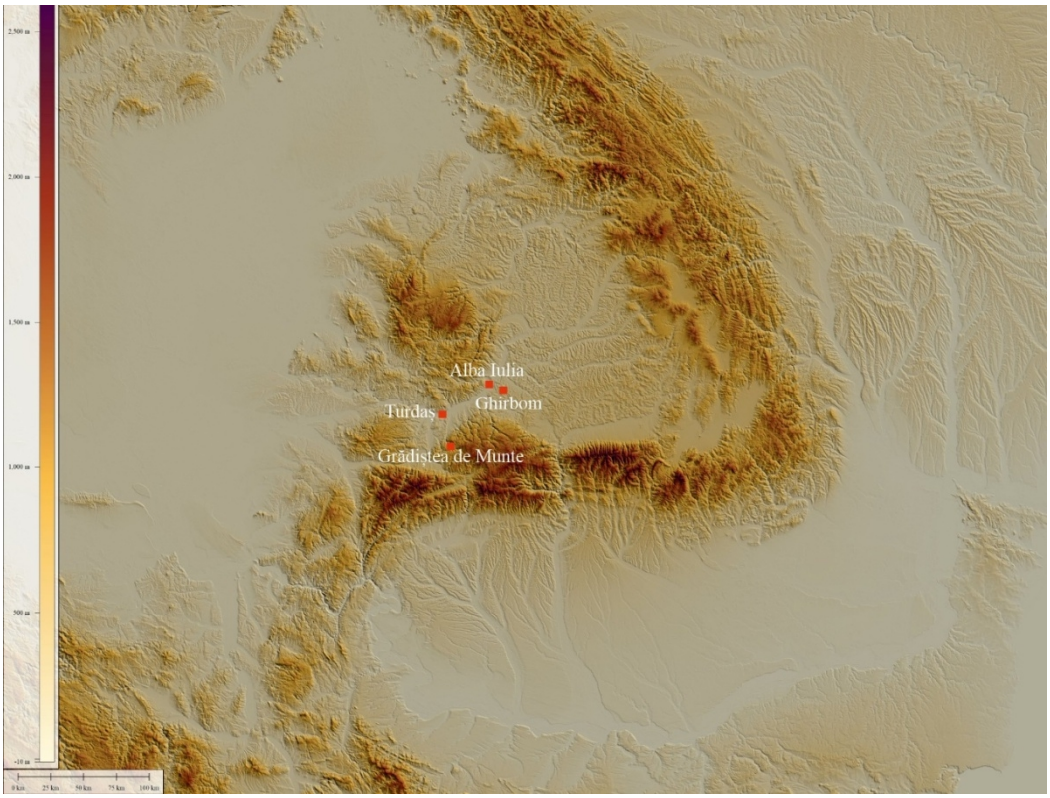

Fig. 8. Harta localităților de „proveniență" a pieselor.
Map of the settlements with the "origin" of the recovered artifacts.

A possible miniature chair from the Hamangia cemetery at Cernavodă *Columbia D*, Romania

Raluca KOGĂLNICEANU*

Abstract: *The Late Neolithic Hamangia culture is not known for miniature representations of buildings or furniture pieces, except for the small chair attached to the famous figurine of "the Thinker". During recent work on the vast quantity of unprocessed and unpublished pottery from the Cernavodă* Columbia D *Hamangia culture burial ground, an artefact was discovered that might represent a miniature clay chair.*

Rezumat: *Cultura Hamangia din neoliticul târziu nu este cunoscută pentru reprezentări plastice de clădiri sau piese de mobilier, cu excepția scăunelului (taburet) atașat de celebra figurină a Gânditorului. În timpul recentei activități de prelucrare a vastei cantități de ceramică nepublicată din cadrul cimitirului Hamangia de la Cernavodă* Columbia D*, a fost identificat un artefact de lut care ar putea reprezenta un scaun miniatural.*

Keywords: *plastic representations, Late Neolithic, Hamangia culture, cemetery*

Cuvinte-cheie: *plastică, neolitic târziu, cultura Hamangia, cimitir*

◈ Introduction

Plastic representations are well known for the Hamangia culture, especially from the two large burial grounds, at Cernavodă (Romania) and Durankulak (Bulgaria). They mostly illustrate the human body, in a more or less schematized form, according to the material they were made of (clay, marble, *Spondylus* or, occasionally, other materials). So far, only one animal figurine, possibly an ovicaprid, was found in a pit within the settlement at Ceamurlia de Jos (Berciu 1966, p. 103, 231, fig. 92/2 and 93/2).

The Hamangia culture is not known for miniature representations of buildings or furniture pieces, except for the small chair attached to the famous figurine of "the Thinker" (Berciu 1960, p. 426).

During recent work on the vast quantity of unprocessed and unpublished pottery from the Cernavodă *Columbia D* Hamangia culture burial ground, an artefact was discovered that might represent a miniature clay chair.

◈ The possible miniature chair

The artefact, with the collection inventory indicative F 520, has been identified in one of the packages containing unprocessed pottery fragments from the site. After considering and subsequently dismissing the hypothesis that it might be some kind of fragmentary vessel handle, we arrived at the opinion that it might illustrate a fragmentary miniature chair.

The dimensions of the preserved piece (fig. 1 and 2) are 5.6 cm in length, 4.9 cm in width and 3.6 cm in height.

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The shape, although incomplete, resembles that of a sitting device with a backrest. The sitting area is not supported by four legs, but on two narrow supports along the piece, one to the front and one to the back. The lower extremities of these supports are broken, so we cannot infer the height of the "legs". The backrest is also broken almost immediately above the sitting area. The "front" margin of the chair is also damaged.

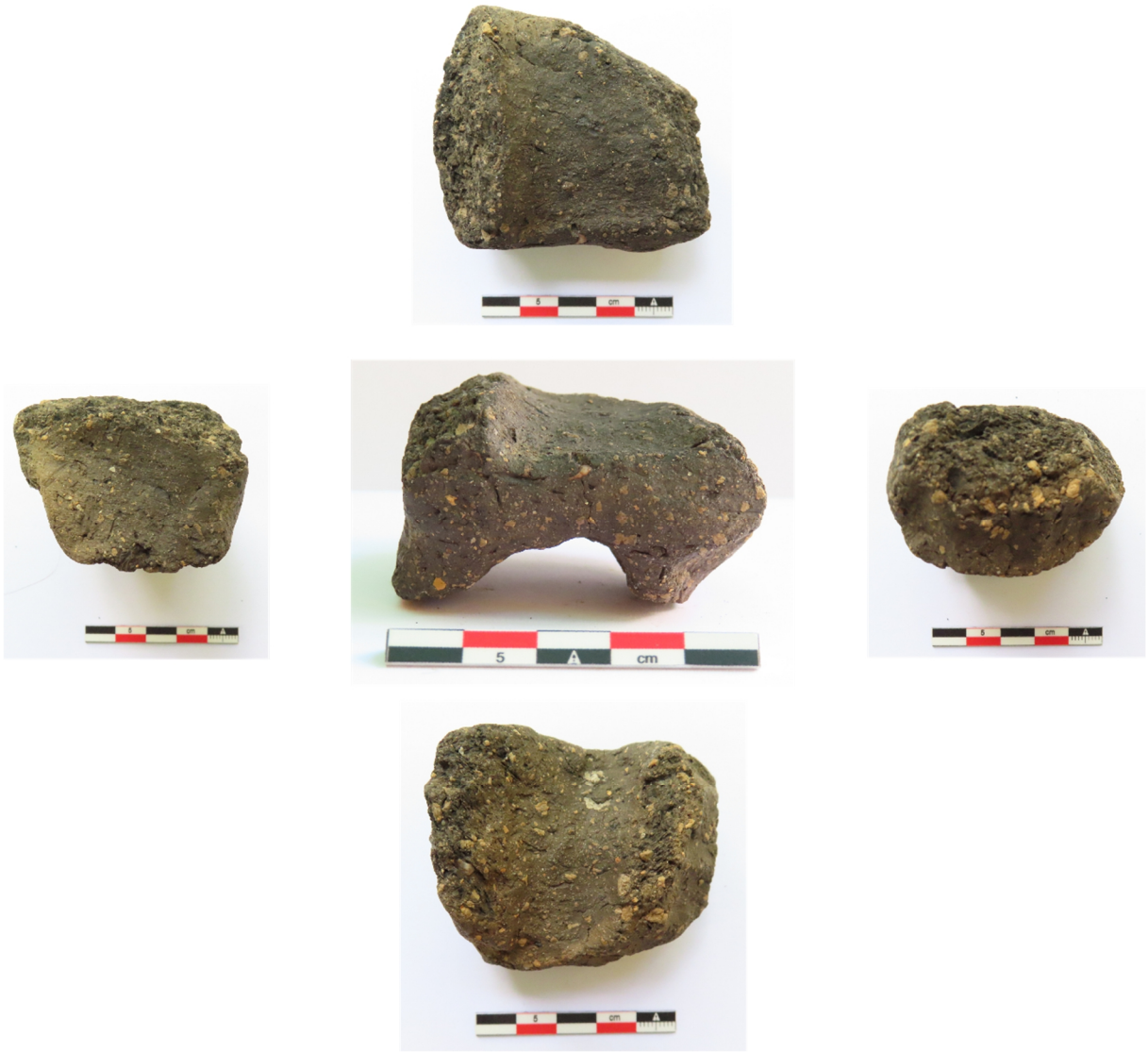


Fig. 1. The possible miniature chair from Cernavodă *Columbia D* site (F 520).
Posibilul scaun miniatural din situl Cernavodă *Columbia D* (F 520).

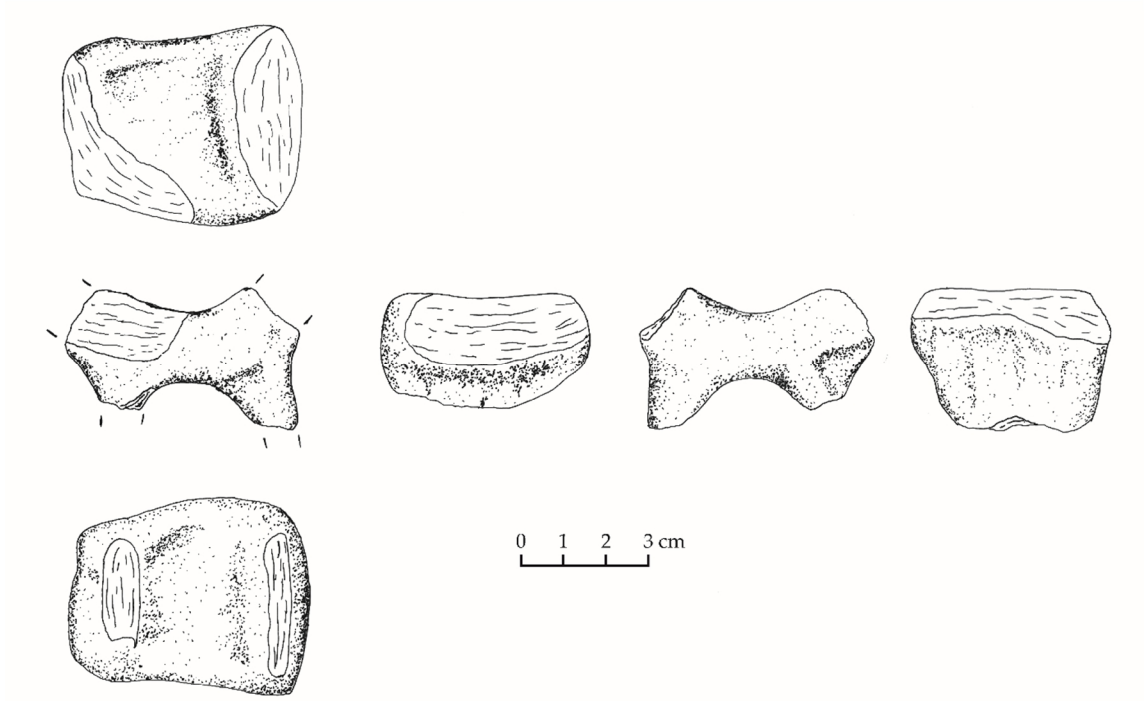


Fig. 2. The possible miniature chair from Cernavodă *Columbia D* site (F 520) (drawing by R. Dobrogeanu).
Posibilul scaun miniatural din situl Cernavodă *Columbia D* (F 520) (desen de R. Dobrogeanu).

Given the shape of the "legs", the item presented here might also be interpreted as some kind of miniature bench (instead of a chair).

Seen from a lateral, the curved inferior part of the sitting area makes the item very similar to a miniature animal silhouette (see the photo and drawing of the animal figurine discovered at Ceamurlia de Jos (Berciu 1966, p. 103, 231, fig. 92/2 and 93/2). Whether this was an intended effect or just a coincidence, it is difficult to say without more similar discoveries.

The fabric used is coarse, including many pieces of crushed burned clay and small pebbles (fig. 3). The modelling was done somewhat negligently, and the artefact was not polished or covered with a finer layer of clay. The firing took place in an oxidizing environment, resulting in a black, uneven color (darker on one lateral side and slightly reddish on the opposite). Nonetheless, the piece was well fired. Fabric and firing of the piece resemble that of the coarse pottery from the site.

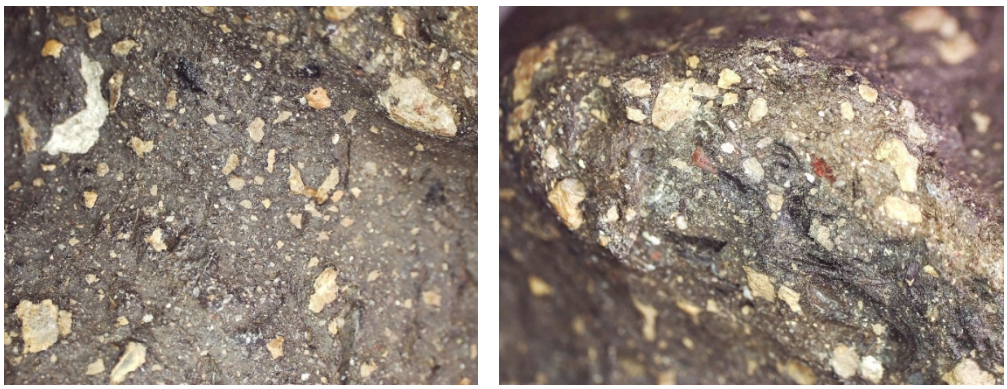


Fig. 3. The possible miniature chair from Cernavodă *Columbia D* site (F 520). Fabric detail.
Posibilul scaun miniatural din situl Cernavodă *Columbia D* (F 520). Detaliu pastă.

In terms of location for the discovery of this artefact, the label from the pottery package indicated the year 1954, the area as Columbia D, Trench S III, at a depth of –0.50 –1.00 m. A note on the original label indicates that the pottery was gathered from an area of the trench "close to Trench S I". Consulting the field notes and the published excavation plan, we think a slight mistake might have been made on the label, and instead of trench S III should be trench S IIIA[1].

This location places the discovery of the artefact outside the area of the classic burials, close to the so-called ritual pits, more specifically east of Pit no. 1 (fig. 4).

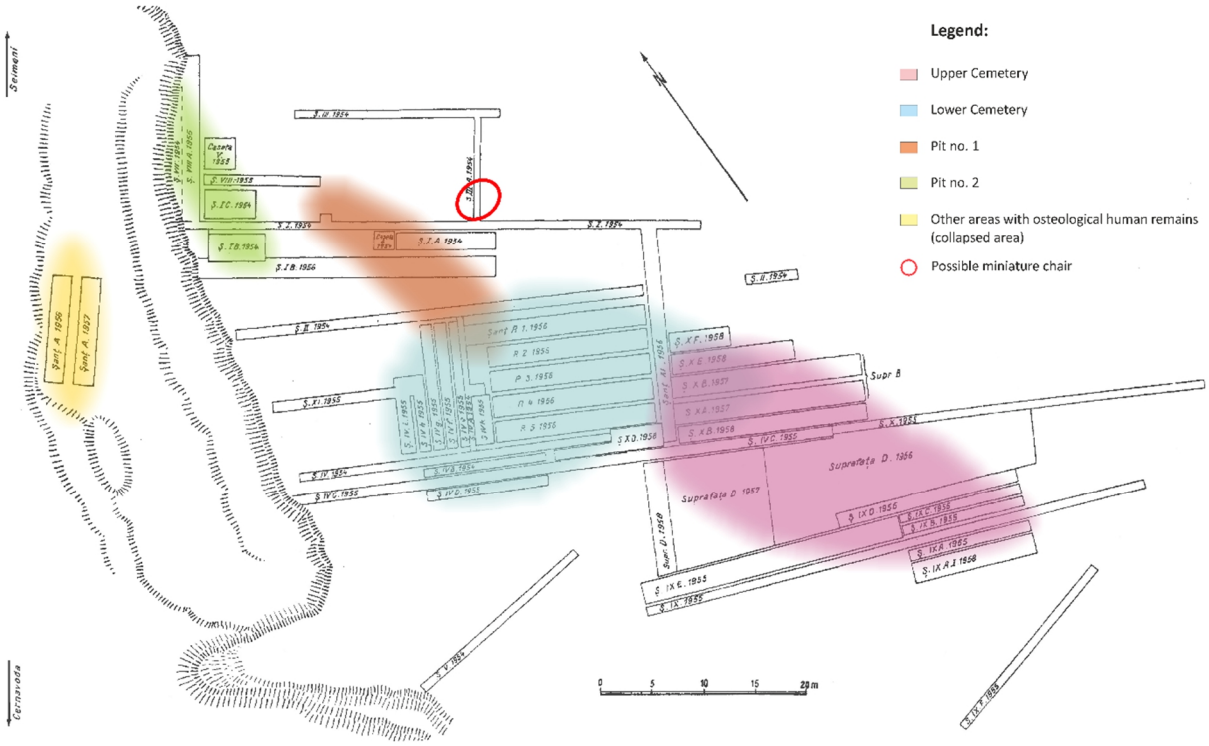


Fig. 4. Location of the possible miniature chair inside the Cernavodă *Columbia D* site.
Localizarea posibilului scaun miniatural în cadrul sitului Cernavodă *Columbia D*.

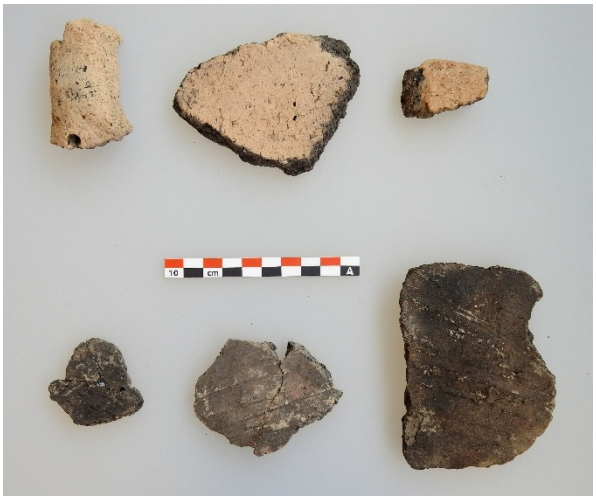
As for chronology and cultural association, the artefact was found with fragments of pottery coming from common ware, mostly coarse, fired in both oxidizing and reduction environments. The pottery fragments are poorly decorated. Lines of round or nail/shell impressions under the mouth were noted on several fragments (fig. 5/a), sometimes combined with barbotine. A handle is also to be noted among the pottery fragments (fig. 5/c), which confirms our previous assertion that the artefact presented here together with the accompanying materials come from Trench S IIIA (see note 1 below). Without being very

[1] "Extremely few sherds were found in Trench S III, starting from the surface and down to -40 -50 cm, below which nothing else was found, the soil being clean yellow" ["În Ş III s-au găsit extrem de puţine cioburi şi acestea începând de la suprafaţă şi până la -40 -50 cm sub care nu s-a mai găsit nimic pământul fiind galben curat"] (Morintz 1954, p. 92). "Trench S IIIA was excavated between Trenches S III and S I in front of square 15. At the extremity of Trench S III A towards Trench S I, between approximately –0.50 and –1 m, an interesting material was found (package no. 12), a vessel handle" (see fig. 5/c – upper row) ["Ş III A a fost săpat între Ş III şi Ş I în dreptul careului nr. 15. La extremitatea şanţului III A către Ş I între aproximativ –0,50 şi –1 m s-a găsit un material interesant (pac. nr. 12), toartă de vas"] (Morintz 1954, p. 127).

indicative, the ceramics that were found together with the possible miniature sitting device suggest an earlier phase of the Hamangia culture, phase II (Goloviţa) (Berciu 1966).

a

b



c

Fig. 5. Pottery fragments found together with the possible miniature chair.
Fragmente ceramice descoperite împreună cu posibilului scaun miniatural.

◈ Discussion and conclusion

As mentioned at the beginning, there is no other miniature sitting device reported in the Hamangia culture, apart from the one attached to the figurine of the Thinker, which is quite different from the piece under discussion here. The Thinker's chair is low, without a backrest, with four short legs and was decorated along the front and back sides. In addition, it was attached to the figurine and not an individual piece (Berciu 1960, p. 426).

Approximately during the same chronological period, but further north geographically, in the Precucuteni culture, miniature sitting devices are more frequent. Although they were found as separate items, they were usually in association with female figurines, and they had backrests in the shape of animal horns, but no feet (Ursulescu, Tencariu 2017, fig. 1; Palaguta 2021, fig. 4). This tradition is continued in the Cucuteni culture (Comșa 1980, p. 47-50). In the Precucuteni-Cucuteni cultural complex chairs with four feet and high backrests were also noted, known as "thrones" in the specialized literature (for an overview, see Comșa 1980). Gumelnița culture on the other hand, is better known for chairs with four legs and high backrests or armchairs with no legs and low backrests (Comșa 1980, p. 40-44).

Our purpose was to bring forth an artefact that, so far, has no published parallels in the Hamangia environment, in order to stimulate the publication of other similar items that might wait for analogies or possible directions of interpretation. The presence of miniature clay sitting devices in the Hamangia culture, if confirmed in the future by other, more complete, items, would enrich the material repertoire of these Late Neolithic communities.

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Cristian Eduard ŞTEFAN - New data concerning the representation of human foot in the Gumelniţa culture
Stoilka TERZIJSKA-IGNATOVA - A new type of Late Chalcolithic zoomorphic cult tables
Dimitar CHERNAKOV - Some observations about the discovered human skeletons at Rousse *tell*
Lolita NIKOLOVA - Towards prehistoric wellness in Eurasia: clay and health
Sorin Cristian AILINCĂI, Florian MIHAIL - Psalii din corn descoperite în aşezări ale culturii Babadag din nordul Dobrogei / *Horn cheek-pieces (psalias) discovered in settlements of Babadag culture from Northern Dobrogea*
Note şi discuţii / Notes and discussions
Alexandru DRAGOMAN, Gabriel DRAGOMIR - A few thoughts inspired by a book
Cătălin LAZĂR - The Second Cemetery from Sultana-*Malu Roşu*? Some hypothetical considerations
Prezentări de carte / Book presentations
Suciu Cosmin Ioan, *Cultura Vinča în Transilvania*, Bibliotheca Brukenthal, XLIV, Editura Altip, Alba-Iulia, 2009, ISBN 978-117-250-7, 304 pagini, 352 figuri (Mădălina VOICU)
Mihai Gligor, *Aşezarea neolitică şi eneolitică de la Alba Iulia-Lumea Nouă în lumina noilor cercetări*, Cluj-Napoca, Ed. Mega, 2009, ISBN 978-606-543-045-7, 482 pagini, 217 planşe (Vasile OPRIŞ)

Studii de Preistorie 8/2011

Douglass W. BAILEY - Interview with Lynn Meskell
Marcel OTTE - La gestion de l'espace au paléolithique
Georgeta El SUSI - Data on husbandry and hunting in the Early Starčevo-Criş settlement from Miercurea Sibiului – 'Petriş' (Sibiu County)
Constantin PREOTEASA - Nouveaux repères chronologiques concernant l'habitation chalcolithique du *tell* de Poduri-*Dealul Ghindaru* (dép. de Bacău – Roumanie)
Radian ANDREESCU - Note asupra decorului unor statuete gumelniţene / Notes on the decoration of some Gumelniţa figurines
Jerzy KOPACZ - Cuţitele curbe de tip *krummesser* – la periferia industriei litice cioplite / Curved knives of *Krummesser* type – periphery of lithic chipped industries
Jesper S. ØSTERGAARD - A perspective on the secondary products revolution in Bulgaria
David L. PETERSON - Archaeology and value: Prehistoric copper and bronze metalwork in the Caucasus
Irene KALANTARIAN - The Early Bronze Age Complexes of Talin Cemetery
Alin FRÎNCULEASA, Andrei SOFICARU, Octav NEGREA, Monica MĂRGĂRIT, Mădălina FRÎNCULEASA, Bianca PREDA, Cornel DAVID - Cimitirul din epoca bronzului de la Câmpina (jud. Prahova) / The bronze age cemetery from Câmpina

Note şi discuţii / Notes and discussions
Cornelia CĂRPUŞ - Analiza microscopică a trei statuete antropomorfe din cultura Cucuteni, de la Drăguşeni, judeţul Botoşani
Cristian Eduard ŞTEFAN - O reprezentare antropomorfă inedită de la Verbicioara
Cristian LASCU, Cristina GEORGESCU - Case de pământ
Cătălin LAZĂR - Some considerations about an anthropo-zoomorphic figurine discovered at Măriuța-*La Movilă* (Southeastern Romania)
Arheologie şi (micro)politică / Archaeology and (micro)politics
Romeo DUMITRESCU - O expoziţie la Vatican (2008)
Romeo DUMITRESCU - Construite pentru a arde / "Build to burn"®: „note de jurnal" despre o încercare de arheologie experimentală

Studii de Preistorie 9/2012
Radu-Alexandru DRAGOMAN - *Studii de Preistorie:* bilanţ după zece ani de apariţie / Prehistorical Studies: *Account after ten years of publication*
Douglass W. BAILEY - Interview with Meg Conkey
Adina BORONEANŢ - The archaeological excavations at Grumăzești – Neamț County. Part 1 – refitting the puzzle
Adrian BĂLĂŞESCU - Exploatarea resurselor animale în cultura Dudeşti pe teritoriul României. Studiu de caz: Măgura-*Buduiasca* / *Animal exploitation in Dudeşti culture on Romania territory. Case study: Măgura*-Buduiasca
Vasile OPRIȘ, Adrian BĂLĂȘESCU, Cătălin LAZĂR - Considerații privind un complex aparținând culturii Boian descoperit în necropola de la Sultana-*Malu Roșu*, jud. Călărași / *Considerations regarding a complex belonging to Boian culture, discovered in the necropolis from Sultana*-Malu Roșu, *Călărași County*
Georgeta EL SUSI - Management of animal resources by Precucutenian communities and their impact on the environment based on recent research in sites from eastern Romania
Cătălin LAZĂR, Gabriel VASILE, Monica MĂRGĂRIT - Some considerations about a new grave discovered at Sultana-*Gheţărie* (Southeastern Romania)
Constantin HAITĂ - Observations at microscope on pottery fabric of some ceramic fragments from Gumelnița *tell* settlements Hârșova and Borduşani Popină
Katia MOLDOVEANU, Radian-Romus ANDREESCU - Sites under threat. Tell settlements from South-East Romania
Ciprian F. ARDELEAN, Juan Ignacio MACÍAS-QUINTERO - The combined use of air photographs and free satellite imagery as auxiliary tools in preliminary archaeological exploration: potential and limitations from three case studies in three distinct geo-cultural regions in Mexico
Călătorii arheologice / Archaeological trips
Radu-Alexandru DRAGOMAN - Despre o călătorie de documentare arheologică în U.R.S.S. / *About a journey of archaeological documentation in U.S.S.R.*
Alexandra GHENGHEA - Un altfel de șantier arheologic: un exemplu din Siberia / *A different archaeological excavation: an example from Siberia*
Prezentări de carte / Book presentations
Eugen Sava, Elke Kaiser, *Поселение с «зольниками» у села Одая-Мичурин, Республика Молдова (Археологические и естественнонаучные исследования)/Die Siedlung mit „Aschehügeln" beim Dorf Odaia-Miciurin, Republik Moldova (Archäologische und naturwissenschaftliche Untersuchungen),* Muzeul Naţional de Arheologie şi Istorie a Moldovei, Biblioteca „Tyragetia", XIX, Editura Bons Offices SRL, 2011, 532 p., ISBN 978-9975-80-525-4 (Tiberiu VASILESCU)

Studii de Preistorie 10/2013

Douglass W. BAILEY - Interview with Cornelius Holtorf

Florin DRAȘOVEAN - In regards to certain Late Neolithic - Early Eneolithic synchronism from Banat and Transylvania. A Bayesian approach to published absolute dates

Cristian Eduard ȘTEFAN, Radu PETCU, Răzvan PETCU - Reprezentări antropomorfe din așezarea neolitică de la Șoimuș-*La Avicola (Ferma 2)*, jud. Hunedoara / *Anthropomorphic representations from the Neolithic settlement from Șoimuș*-La Avicola (Ferma 2), *Hunedoara County*

Cătălin LAZĂR, Cristian Eduard ŞTEFAN, Gabriel VASILE - Consideraţii privind resturile osteologice umane din cadrul unor aşezări eneolitice din sud-estul României / *Considerations regarding the human osteological remains from some Eneolithic settlements from south-east Romania*

Cătălin BEM, Andrei ASĂNDULESEI, Constantin HAITĂ, Carmen BEM, Mihai FLOREA - Interdisciplinary investigations. The tell settlement from Vătaşi Măgura (Teleorman County, Romania)

Loredana NIŢĂ, Ana ILIE - The lithic collection from the Chalcolithic tell of Geangoeşti (Dâmboviţa County)

Nina MANASERYAN, Lilith MIRZOYAN - Armenia: Animal Remains from Neolithic and Bronze Age Settlements and Burials (Review of osteological material from the collection funds of the Institute of Zoology)

Ion TORCICĂ - Descoperiri Cernavodă III în situl de la Măgura *Buduiasca* (judeţul Teleorman) / *Cernavodă III discoveries in the site from Măgura* Buduiasca *(Teleorman County)*

Tiberiu VASILESCU - O dată ^{14}C de la Năeni-Zănoaga, Cetatea 1 / *One ^{14}C date from Năeni-Zănoaga, Cetatea 1*

Alin FRÎNCULEASA - Podoabe preistorice din materiale vitroase. Descoperiri în cimitirul din epoca bronzului de la Câmpina (jud. Prahova) / *Prehistoric jewellery items from vitreous materials. Discoveries in the bronze age cemetery from Câmpina (Prahova County)*

Mihai CONSTANTINESCU - Analiza antropologică a unui schelet din prima epocă a fierului de la Saharna (Rep. Moldova) / *Anthropologic analysis of a skeleton from the first epoch of Iron Age from Saharna (Rep. of Moldova)*

Alexandru BARNEA - Sur les Celtes au Bas-Danube

Note şi discuţii / Notes and discussions

Radu-Alexandru DRAGOMAN - A political chronicle of Romanian archaeological exhibitions: the case of the "Cucuteni civilization"

Nina MANASERYAN - Armenia: Wild Boar in All Issues

Nora YENGIBARYAN - The Urartian materials from Sodk Danube

Alexandra ION - De ce avem nevoie de Arheologie publică în România? / *Why we need Public archaeology in Romania ?*

Versuri arheologice / Archaeological lyrics

C.S. NICOLĂESCU-PLOPȘOR (grupaj conceput de Silvia Marinescu-Bîlcu și Radu-Alexandru Dragoman/ *grouping conceived by Silvia Marinescu-Bîlcu and Radu-Alexandru Dragoman*)

Studii de Preistorie 11/2014

Radu-Alexandru DRAGOMAN - Interview with Douglass W. Bailey

Mircea ANGHELINU - Stasis and change in Paleolithic times. A brief assessment of the Lower and Middle Paleolithic evolutionary dynamics

Ciprian F. ARDELEAN - The early prehistory of the Americas and the human peopling of the Western Hemisphere. An overview of archaeological data, hypotheses and models

Laurens THISSEN - Boian period ceramics from Teleor 008, a site in South of Romania

Emma WATSON, Bisserka GAYDARSKA - Little Cucuteni pots of hope: a challenge to the divine nature of figurines

Adina BORONEANŢ, Alin FRÎNCULEASA, Valentin DUMITRAŞCU - New data on the Stoicani-Aldeni cultural aspect. The archaeological excavations from the Eneolithic site at Bălăneşti (Buzău County)

Mihaela GOLEA, Mala STAVRESCU-BEDIVAN, Cătălin LAZĂR - Macroresturi vegetale descoperite în situl arheologic Sultama – Malu Roșu, județul Călărași: studiu preliminar / *Vegetale macrorests discovered at Sultana* – Malu Roșu *archaeological site, Călărași County: preliminary study*

Mihai CONSTANTINESCU, Mihaela CULEA - Studiul antropologic al cimitirului neolitic de la Gârlești, jud. Dolj / *Anthropologic study of the Neolithic cemetery from Gârleşti, Dolj County*

Alin FRÎNCULEASA, Bianca PREDA, Tiberiu NICA, Andrei-Dorian SOFICARU - Un nou tumul preistoric cercetat la Ariceștii Rahtivani (jud. Prahova) / *A new prehistoric tumulus investigated at Ariceştii Rahtivani (Prahova County)*

Alexandra ION - The making of historical bodies: sex, race, and type in the Beginnings of the Romanian physical anthropology?

Studii de Preistorie 12/2015

Pagini din istoria arheologiei românești / Pages from the history of Romanian archaeology

Radu-Alexandru DRAGOMAN - Aux débuts de l'archéologie moderne roumaine: les fouilles d'Atmageaua Tătărască

Studii / Studies

Alexandru CIORNEI - On the so-called "Kriva Reka type" of Ludogorie chert: a petrographic perspective from the Upper Palaeolithic sites in the Giurgiu-Călăraşi area (southern Romania)

Monica MĂRGĂRIT, Camelia-Mirela VINTILĂ - New information from old collections. Reevaluation of personal adornments made of hard animal materials from the necropolis of Cernica

Cristian Eduard ŞTEFAN, Radu PETCU - Notă asupra unor capace de lut cu trăsături umane de la Şoimuş-*La Avicola (Ferma 2)*, jud. Hunedoara / *Note on clay lids with human traits from Șoimuș*-La Avicola (Ferma 2), *Hunedoara County*

Mădălina DIMACHE, Constantin HAITĂ - Analysis at microscope of some Gumelnița pottery fragments from Bordușani *Popină* tell settlement

Ana ILIE, Katia MOLDOVEANU, Migdonia GEORGESCU - Note despre două sârme din aur din cultura Gumelnița / *Notes on two golden wires from Gumelnița culture*

Mădălina VOICU - Technology and functionality of the quadrilobed Wietenberg vessel

Luciana RUMEGA-IRIMUȘ - A mass grave and other contexts containing human remains discovered in the Hallstatt-period site at Tărtăria – *Podu Tărtăriei vest* (Alba County)

Gabriel VASILE, Marius ILIE - Assessment of an Iron Age skeletal assemblage from Romania, Tărtăria *Podu Tărtăriei vest* (Alba County, Romania)

Mihai Ștefan FLOREA - Anthropic impact on the archaeological sites reflected in geospatial analysis. Study case: Ilfov County

Prezentări de carte / Book presentations

Tiziana Matarazzo, *Micromorphological analysis of activity areas sealed by Vesuvius' Avellino eruption. The Early Bronze Age village of Afrangola in southern Italy*, Archaeopress Archaeology, Oxuniprint, Oxford, 2015, 200 p., 72 figuri color, anexă cu 91 figuri color, ISBN 978-1-78491-211-6 (Constantin HAITĂ)

Studii de Preistorie 13/2016

Pagini din istoria arheologiei românești / Pages from the history of Romanian archaeology

Radu-Alexandru DRAGOMAN - Pagini inconfortabile din istoria arheologiei românești: Odessa și Transnistria, 1941-1944 / *Uncomfortable pages from the history of Romanian archaeology: Odessa and Transnistria, 1941-1944*

Studii / Studies

Ciprian F. ARDELEAN - The "Transitional Period": a short terminological debate around the Pleistocene-Holocene Transition in North American prehistory

Cătălin BEM, Constantin HAITĂ - *Tell*-ul Bucșani *Pod* (Muntenia, România). Caracteristici tipologice și petrografice ale utilajului litic *șlefuit* din nivelul superior (Gumelnița B1) / Tell *Bucșani Pod (Wallachia, Romania). Tipological and petrographical features of* polished *litic inventory from the upper level (Gumelnița B1)*

Mihaela GOLEA - Discuții asupra prezenței speciei *Chenopodium album* în așezările preistorice din România / *Discussions on the presence of the species Chenopodium album in the prehistorical settlements from Romania*

Monica MĂRGĂRIT, Mariana PROCIUC - Ce ne spun oasele prelucrate dintr-o groapă menajeră? Cazul așezării eneolitice de la Fruntișeni (jud. Vaslui) / *What the worked bones from a waste pit tell us? The case of the Chalcolithic settlement from Fruntișeni (Vaslui County)*

Vasile DIACONU, Sergiu-Constantin ENEA, Dumitru BOGHIAN - Câteva piese atribuite epocii bronzului şi primei epoci a fierului din zona centrală a Moldovei / *Some pieces attributed to the Bronze Age and Hallstatt from the central area of Moldavia*

Mihai CONSTANTINESCU, Jenna WATSON, Thomas A. CRIST - Short anthropological report on the Bronze Age cemetery from Hăpria Hunedoara

Adrian BĂLĂȘESCU, Mădălina VOICU, Monica MĂRGĂRIT, Valentin RADU - Bronze Age Fauna from Pianu de Jos-*Lunca Pârâului* (Wietenberg culture)

Note şi discuţii / Notes and discussions

Alexandru CIORNEI - The saga of the astonishing ^{14}C dates obtained on some "wooden" objects from Grădinile and Măgura sites (Early Neolithic, southern Romania)

Cristian Eduard ŞTEFAN - Notă asupra unor piese din metal de la Glina-*La Nuci* / *Note on some metal pieces from Glina*-La Nuci

Prezentări de carte / Book presentations

V. Spinei, N. Ursulescu, V. Cotiugă (Eds.), *Orbis Praehistoriae. Mircea Petrescu-Dîmbovița – in memoriam*, Editura Universității "Alexandru Ioan Cuza", Iași, 2015, 728 p, ISBN 978-606-714-131-3 (Cristian Eduard ŞTEFAN)

Studii de Preistorie 14/2017

Pagini din istoria arheologiei românești / Pages from the history of Romanian archaeology

Radu-Alexandru DRAGOMAN - Trecutul politic al unei monografii arheologice: *Hăbășești*, 1954 / *The political past of an archaeological monograph:* Hăbășești*, 1954*

Studii / Studies

Mircea ANGHELINU, Monica MĂRGĂRIT, Loredana NIȚĂ - A Paleolithic eyed needle from Bistricioara-Lutărie III (Ceahlău Basin, Northeastern Romania)

Monica MĂRGĂRIT, Adina BORONEANȚ, Mariana BALINT, Adrian BĂLĂȘESCU, Clive BONSALL - Interacțiuni om-mediu în situl mezolitic de la Icoana (Porțile de Fier) / *Human-environment interactions at Mesolithic Icoana (the Iron Gates Gorges)*

Cătălin BEM - Despre *Microzona Bucşani* şi ansamblul de situri Bucşani *Pădure* (precizări necesare) / *About* Microzone Bucşani *and the ensemble of sites Bucşani* Pădure *(necessary remarks)*

Vasile OPRIȘ, Cătălin LAZĂR, Theodor IGNAT - Technological analysis of Boian-Vidra pottery from Sultana

Cătălin BEM - An eneolithical length measurement unit. The *Pian*

Cătălin LAZĂR , Adrian BĂLĂȘESCU, Ionela CRĂCIUNESCU, Cristina COVĂTARU, Mihaela DANU, Adelina DARIE, Mădălina DIMACHE, Mihai FLOREA, Ovidiu FRUJINA, Mihaela GOLEA, Constantin HAITĂ, Theodor IGNAT, Bogdan MANEA, Monica MĂRGĂRIT, Vasile OPRIȘ, Valentin RADU, Tiberiu SAVA, Gabriela SAVA, Dan ȘTEFAN, Gabriel VASILE - Gumelnița: Then and Now. The research results of the 2017 fieldwork

Tudor HILA, Cătălin BEM - Considerații asupra utilajului litic cioplit din stațiunea de la Satu Barbă *Groapa de Animale* / *Considerations on the chipped lithic tools from the site at Satu Barbă* Groapa de Animale

Prezentări de carte / Book presentations

Ian Hodder (ed.), *Religion at work in a Neolithic society: vital matters*, Cambridge, 2014, Cambridge University Press, 382 p. and 47 figs., ISBN 978-1-107-67126-3 (Radu-Alexandru DRAGOMAN)

Ольга В. Лозовская, Андрей Н. Мазуркевич, Екатерина В. Долбунова (ред.), *Традиции и иновации в изучении древнейшей керамики. Материалы международной научнойконференции 24-27 мая 2016 года, Санкт-Петербург, Россия*, Санкт-Петербург, 2016, Институт Истории Материалной Культуры, Россиская Академия Наук / Olga V. Lozovskaya, Andrey N. Mazurkevich, Ekaterina V. Dolbunova (eds.), *Traditions and innovations in the study of earliest pottery. Materials of the international conference, May, 24-27, 2016, St. Petersburg, Russia*, St. Petersburg, 2016, Institute for the History of Material Culture, Russian Academy of Sciences; 256 p., ISBN 978-5-9907148-9-2 (Radu-Alexandru DRAGOMAN)

Studii de Preistorie 15/2018

Pagini din istoria arheologiei românești / Pages from the history of Romanian archaeology

Radu-Alexandru DRAGOMAN - O carte de la începuturile arheologiei moderne românești / *A book from the beginnings of modern Romanian archaeology*

Studii / Studies

Loredana NIȚĂ, Cristina CORDOȘ, Mircea ANGHELINU - Apprenticeship lithic debitage. Examples from a 27.3 ka cal BP Gravettian collection from Bistricioara-Lutărie III (Ceahlău Basin, NE Romania)

Florin DRAŞOVEAN - A *Spondylus Gaederopus* Linnaeus, 1753 spiny oyster pendant from the Neolithic settlement of Sânandrei-*Ocsăplaț* (Timiş County, western Romania)

Georgeta El SUSI - Preliminary report on the faunal remains from the Early Neolithic site (Starčevo-Criş IIIB-IVA) at Tăşnad-*Sere*, Satu Mare County

Monica MĂRGĂRIT, Camelia-Mirela VINTILĂ - Podoabe și figurine confecționate din materii dure animale descoperite în așezarea eneolitică de la Vidra (jud. Ilfov) / *Personal adornments and figurines made of hard animal materials discovered in the Eneolithic settlement of Vidra (Ilfov County)*

Ion TORCICĂ - Greutățile de lut decorate din *tell*-ul Vităneşti *Măgurice*, jud. Teleorman / *Decorated loom weights from Vităneşti* Măgurice tell *settlement, Teleorman County*

Xenia POP, Alexandru GUDEA, Aurel DAMIAN - Gospodărirea animalelor în așezarea Makó de bronz timpuriu de la Pecica-Site 14 / *Animal husbandry in the Makó bronze age settlement from Pecica-Sit 14*

Cristian Eduard ȘTEFAN - Notă asupra unui capac zoomorf neolitic de la Romula (Reșca, jud. Olt) / *Note on a neolithic zoomorphic lid from Romula (Reşca, Olt County)*

Prezentări de carte / Book presentations

Maurizio Forte, Stefano R.L. Campana (eds.), *Digital Methods and Remote Sensing in Archaeology, Archaeology in the Age of Sensing*, Berlin, 2016, Springer International Publishing, 496 p., 223 fig., ISBN 978-3-319-40656-5 (Ovidiu Alexandru FRUJINĂ)

Christoph Siart, Markus Forbriger, Olaf Bubenzer (eds.), *Digital Geoarchaeology. New Techniques for Interdisciplinary Human-Environmental Research*, Natural Science in Archaeology, 2018, Springer, 269 p., ISBN 978-3-319-25314-5 (Cristina-Ioana COVĂTARU)

Andrei Asăndulesei, *GIS (Geographic Information System), fotogrametrie și geofizică în arheologie. Investigații non-invazive în așezări Cucuteni din România*, Iași, 2018, Colecție: Bibliotheca Archaeologica Moldaviae, Editura Universității "Al. I. Cuza", 274 p., ISBN 978-606-714-215-0 (Adrian ȘERBĂNESCU)

Studii de Preistorie 16/2019

Pagini din istoria arheologiei românești / Pages from the history of Romanian archaeology

George TROHANI - Din însemnările profesorului Gheorghe Cantacuzino (1900-1977). V. Preliminarii privind cercetarea arheologică a fostei Mănăstiri Cătălui / *Dès notes du professeur Georges Cantacuzène (1900 – 1977). V. Préliminaires Concernant les recherches archéologiques de l'ancien Monastère Cătălui*

Studii / Studies

Monica MĂRGĂRIT, Mădălina DIMACHE - Personal adornments discovered in the Boian funerary contexts: necropolis of Sultana-Valea Orbului (Călărași County, Romania)

Cristian Eduard ȘTEFAN, Ion DUMITRESCU, Aurelia GROSU, Ioan Andi PIȚIGOI - Cercetările arheologice preventive de la Slatina, str. Viorelelor, jud. Olt / *Preventive archaeological researches from Slatina, Viorelelor street, Olt County*

Radian-Romus ANDREESCU, Katia MOLDOVEANU - Looking around the tell-settlements. A view from Southern Romania

Valentin RADU, Monica MĂRGĂRIT, Adrian BĂLĂȘESCU - Unelte din mandibule de câine (*Canis familiaris*) de la Căscioarele *Ostrovel* (cultura Gumelnița) / *Dog (*Canis familiaris*) mandibles tools from Căscioarele* Ostrovel *(Gumelnița culture)*

Alin FRÎNCULEASA - The Children of the Steppe: descendance as a key to Yamnaya success

Note şi discuţii / Notes and discussions

Andreea BÎRZU - Notă asupra decorului unei statuete antropomorfe neolitice descoperite la Rast, județul Dolj / *Note regarding the decoration of a Neolithic anthropomorphic figurine discovered in Rast, Dolj County*

Recenzii / Book reviews

Sabin Adrian Luca, *Așezări neolitice pe valea Mureșului (III). Noi cercetări arheologice la Turdaș-Luncă. II. Campaniile anilor 1996–1998*, Bibliotheca Septemcastrensis XXV, Editura Universității „Lucian Blaga", Sibiu, 2018, ISBN 978-606-12-1551-5 (Dragoș DIACONESCU)

Studii de Preistorie 17/2020

Studii / Studies

Constantin HAITĂ, Valentina VOINEA, Bartłomiej Szymon SZMONIEWSKI - Analiza micromorfologică a secvenței stratigrafice inferioare din situl Peștera „Craniilor" (sat Cheia, jud. Constanța) / *Micromorphological analysis of the lower stratigraphic sequence from the "Craniilor" Cave site (Cheia village, Constanța County)*

Monica MĂRGĂRIT, Adina BORONEANȚ, Adrian BĂLĂȘESCU, Valentin RADU - Analiza tehnologică a industriei cornului de cerb din situl Cucuteni de la Drăgușeni-*Ostrov* (jud. Botoșani) – o nouă discuție / *The technological study of the red deer antler industry from the Cucuteni site at Drăgușeni*-Ostrov *(Botoșani County) – a new discussion*

Tomasz J. CHMIELEWSKI - On the presence of the Bodrogkeresztúr culture pottery in Dąbki

Sergiu POPOVICI, Adela KOVÁCS - Complexe eneolitice de cult ale păstorilor timpurii din nordul și nord-vestul Mării Negre / *Eneolithic cult features of early shepherds in the north and northwest region of the Black Sea*

Adrian BĂLĂŞESCU, Florin VLAD, Valentin RADU - Studiul preliminar al materialului faunistic din nivelul Cernavodă I de la Săveni *La Movile* (județul Ialomița) / *Preliminary study of the Cernavodă I level faunal material from Săveni* La Movile *(Ialomița County)*

Alin FRÎNCULEASA - Cultura Cernavodă II la Dunărea Inferioară. Relevanța cronologiei și a înmormântărilor tumulare / *Cernavodă II culture on the Lower Danube. Relevance of chronology and tumular burials*

Gânduri despre cei ce ne-au părăsit / Thoughts about those which left us

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