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Polished lithic tools from neolithic and early eneolithic in north-west Romania.Case study: the site from Porț-”Corău”

Doctoral Thesis

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ABSTRACT

Key words: polished stone industry, chisels, axes, adzes, stone processing, neolithic economy

I. Introduction

I.1. Motivation in choosing the theme

The choice of the theme was motivated by the very large quantity of polished lithic material found in the preventive excavation campaigns at Porţ-Corău and remained unpublished. The purpose was to clarify and to detail the process of working the polished stone tools, having the most numerous set of pieces in the Romanian Neolithic and the possibility to analyze them in a stratigraphical context. Other discoveries in the north-western area of Romania have been used to outline a general picture of the evolution of the ground stone industry in this area.

I.2. Geograpical frame

The north-western area of Romania is bounded by the Hungarian border to the west, the border with Ukraine in the north and the northwest, the Oriental Carpathians (Oaș Mountains) in the north-east, continuing to the east with the limit of the Codru's peak, and south of the Meseș Mountains and Crișul Repede river. All of the unpublished material comes from the Silvania Depression, framed in the eastern middle of the horgist-hill that begins in the vicinity of the town of Șimleu Silvaniei and continues up to the Poiana Codrului locality. Within this great depression, smaller ones are distinguished: the Depression of Șimleu, Zalău and Sălaj, each constituting an association of hills and erosion widenings.

Petrography of the area

The analyzes carried out on the specimens discovered at Suplacu de Barcău indicated the Plopis Mountains as an area of origin of the raw material, with the possibility of exploiting the buckets from the alluviums of the Barcău River. The following types of rocks were

processed: very tough: amphibolite, porphyry, quartz, dacit, riolite; harsh: paragnais, chlorite shale, amphibolito-chlorite shale, feldspartic sandstones; soft: limestone, clayey, clayey sandstone.

I.3.History of research

Studies on polished stone in northwestern Romania are almost exclusively linked to the activity of Doina Ignat. Several articles focused on typology, analysis of processing methods and techniques, and then included into the monograph of the Suplac group in the chapter regarding the polished stone tools. The same researcher has developed a repertoire of sandstone pieces discovered in the Crişana area. Using the criteria established in the respective works and starting from the analysis of the ground polished lithic material from Porţ-Corău, we have developed a new typology and we have rediscussed the stages of processing in an article for each subject.

I.4.Research methods

A first objective was the classification, not only typologically, but also on the processing stages, following the processing methods used, deduced from the traces kept on the litic tools. The second objective was to discuss the material on contexts, each taking into account the relative chronology of the site. The analysis and the interpretation aimed at the reconstruction of the operational chain corresponding to the processing.

I.4.1.Terminology and classification criteria of polished lithic tools

We have defined considering the characteristics of the samples discovered the following terms: simple cores (results of splitting of the raw material), cores with traces of working (bearing marks indicating the detachment or preparation of detachment of fragments suitable for grinding), preforms (lithic fragments with dimensions and contours similar to the tools but with no edge). In this subchapter we have also established the criteria for framing the pieces in the three stages of processing: incipient, advanced, final: shape symmetry, edge contouring, surface grinding. For the typological framing of the pieces we took into consideration the shape and longitudinal profile.

II. Neolithic and Early Eneolithic in Northwest Romania

For the Neolithic and Eneolithic periodization we used the system developed by C.M. and Gh. Lazarovici. The early Neolithic is defined as the period in which the neolithization process ends, the middle Neolithic is individualized for the areas where the influence of Vinča and the Polychromy is indirect, the late Neolithic is seen as the result of the first migrations at the Vinča C level, and the early Eneolithic includes the following migrations in Vinča C, especially C2 and C3. The settlement that constitues the case study of this work was

born in the late Neolithic, continuing its evolution in early Eneolithic, perhaps even during the Vinča D. phase.

III. Analyzing the polished lithic tools from PORȚ- *CORĂU*

III.1. Overview of the polished stone industry and discovery conditions

More than 500 polished lithic pieces were discovered in the part of the site from Bihor, at Suplacu de Barcău, along with raw material with traces of processing, indicating the highest frequency of polished tools from Romania. The preventive excavations at Porț, the part of the site from Salaj, led to the discovery of 1641 samples, meaning: 9% -raw material, 23% -preforms, 5%- processing waste, 40% -chisels, 9%- ax, 1%-ax-chisels, adzes -2%, percutors-2%, smashing stones- 4% ,2% -mills, 1% -sawing and grinding stone slabs, 1%-varia, 3% fragments.

III.2. Raw material and its processing

It has appeared in the form of river boulders grouped in agglomerations that we have interpreted as processing areas. Near the stones or even below some of them, there were consistent traces of burning indicating the use of thermal shock to break the boulders. Another method used for this purpose was the hard percussion, performed with a heavy percutor. The alignments of boulders could have served as supports in the technique called "hammer and anvil". Simple cores were the result of both processes. We have further analyzed the characteristics of the cores with processing traces to deduce the techniques used to obtain the preforms. We have delimitated four categories of cores: with polished strips, with sawing traces, with sawing and pecking traces, with pecking traces.

III.3. Preforms

They represent the final reshaping of the raw material, resulting in fragments suitable for grinding.

III.3.1. Preforms for chisels

Most preforms (247 samples) were for this category of tools. Depending on the combination of characteristics, they can be classified as: preforms with sawing marks and polished profiles, preforms with sawing and pecking traces, preforms with pecking traces, preforms with grinding traces. Most of the preforms for the chisels belong to the last category, the grinding beeing subsequent to the ontaining of the preform.

III.3.2. Preforms for axes

They are more massive than the previous ones, and according to their characteristics they are grouped in: preforms with sawing marks, preforms with sawing and pecking traces, preforms with pecking traces, preforms with grinding traces. The presence of the pecking

traces is much more frequent than for the preforms of the chisels, but the most numerous specimens are all with grinding traces.

III.3.3. Preforms for adzes

They have the convex-concave longitudinal profile. They were grouped into: preforms with sawing and pecking traces (the most numerous category), preforms with pecking traces, preforms with grinding marks.

III.3.4. Preforms unframed to a category

In appearance and dimensions, these preforms are between the chisel and the axes ones. They were divided into: preforms with sawing marks, preforms with sawing and pecking traces, preforms with pecking traces, preforms with grinding traces (the majority).

III.4. Woodworking tools

After the preform was detached, the processing of the pieces implied grinding alternately with pecking. Some pieces, usually axes, could also be perforated. After the processing operations, waste resulted, meaning very thin fragments of stone. Some of these have traces of sawing, others of pecking but most of them do not have specific traces. The latter may be the result of percussion or grinding wich caused exfoliation. A particular type of waste is the perforation core resulting of the tubular perforation.

III.4.1. Chisels

Chisels are tools designed for fine wood processing. They are relatively thin and flat. From a typological point of view, the chisels from Porț are divided into: **D1 - rectangular type** with the following variants: D1a -with rectangular profile, D1b- with plain-convex profile, D1c- with oblique profile; **D2- elongated type** with the following variants: D2a- with rectangular profile, D2b- with plain-rounded profile, D2c- with plain-convex profile, D2d- with oblique profile, D2e- with convex-oblique profile; **D3- trapezoidal type** with the following variants: D3a- with rectangular profile, D3b- with rounded profile, D3c- with plain-convex profile, D3d- with oblique profile; **D4- oval type** with the following variants: D4a with rectangular profile, D4b- with plain-rounded profile, D4c- with rounded profile, D4d- with oblique profile.

The advanced processing chisels are characterized by moderate asymmetry, advanced surface grinding and contoured edge. Sometimes they may have a symmetrical outline, indicating a different working, focusing primarily on shape, not sharpening and levelling the faces. The same explanation can be given in the case of a few pieces showing a slightly contoured edge or a superficial grinding. Some chisels have sharp edges, even finite grinding.

These are closer to the finished stage, but lacking symmetry. Pecking traces are frequent, indicating its alternation with grinding.

Characteristic of the chisels in the early stage of processing are pronounced asymmetry, superficial grinding and contoured cutting edge, except for those of the oval type, where the slightly contured cutting edge appears more often. Pecking traces are more frequent than at chisels in advanced stage of processing. Some pieces, especially those that are unmatched by typology, show sawing marks. If they associate with the slightly contoured cutting edge, we are dealing with chisels closer to the preforms than the majority. Rarely, we have noticed common features for the advanced processing stage: the symmetrical contour or sharpened edge, however, associated with a poorly grinding, or finished polish of the surface of a piece with a pronounced asymmetry.

Over 50% of the chisels fit the advanced stage of processing, except for type D2 where 30% of the specimens are finished, for the other types the percentage of the latter ranges between 8 and 14%. Chronological phase distribution is similar in the case of the first three types of chisels, only for type D4 there is an increase in processing in Suplac III phase. Chisels are considered to be tools used for carving and scraping wood. I tried to combine their typology with functionality. The D1-type may be suitable for scraping, D3-type for cutting (through the protrusion of the edge), plain-convex profile for scraping. Not all variants correspond to different uses, they can be influenced by the qualities of the rock, craftsman skills, later retouching.

III.4.2. Axes

They are characterized by massiviness and can be distinguished from the chisels especially by the thickness whose value is usually equal to or greater than the width, the more prominent or missing tip, the edge being obtained by the oblique grinding of the faces.

From a typological point of view, they are divided into: **T1 – block type** with the variants: T1a - unperforated and T1b - perforated; **T2 - elongated type** with the following variants: T2a- with rectangular, non-perforated profile, T2b - with perforated rectangular profile, T2c- with plain-convex profile; **T3- trapezoidal type**; **T4 - with the oblique profile** having the following variants: T4a - perforated with the maximum width at the cutting edge, T4b - perforated with the minimum width at the cutting edge, T4c - not perforated, with the minimum width at the cutting edge.

The characteristics of the advanced processing stage axes differ depending on the type. In the case of the first two types, T1 and T2, the pieces are characterized by the contoured cutting edge and the advanced grinding, while the other two types, T3 and T4,

have more often a sharp edge. A different approach to the processing is deduced in the case of axes with a slightly contoured edge or a symmetrical contour - the preoccupation with the shape.

The early processing stage axes are characterized by the contoured cutting edge and the superficial surface grinding, most often exhibiting pecking traces. Many of them have a poorly contoured cutting edge. One sample with a groove and another with an incipient perforation at the cutting edge indicates the possibility of reorienting the process, in the first case by cutting the excess rock and in the second by abandoning the failed perforation following the contouring of the cutting edge to the end of the piece thined by fragmentation. Generally there are many scrapes caused by unsuccessful perforation.

Compared to the chisels, the axes appear in smaller numbers and exhibit a lower typological variety. Adding the higher percentage of finite specimens, it can be inferred that the axes were processed less for exchange and more for domestic purposes, except T1 type. They were used for deforestation, the largest, or the cutting of branches the smallest.

III.4.3. Axe-chisels

These pieces, by their shape and width-thickness ratio, are approaching the characteristics of the chisels, but by massiveness of those of the axes. Based on the shape, we divided them into two types: **rectangular-TD1** and **trapezoidal-TD2**, both with a longitudinal plain-convex profile, represented by a finished specimen each. To these were added a preform, two pieces in the advanced stage and four in the early stage of processing.

III.4.4. Adzes

Adzes are pieces characterized by the asymmetric cutting edge, resulting from the predominant or exclusive grinding of the edge in one direction, which gives them a certain inclination.

From a typological point of view, they are divided into: **Te1- trapezoidal type**, with the following variants: Te1a- with plain-rounded profile, Te1b- with rounded profile, Te1c- with oblique-plain profile; **Te2- elongated type**, with the following variants: Te2a- with rectangular profile, Te2b- with oblique profile, Te2c- with convex-concave profile; **Te3- oval type**; **Te4- rectangular type**, with the following variants: Te4a- with rectangular profile, Te4b- with plain-rounded profile.

Almost half of the advanced processing stage adzes have sharp edges, the others have just contoured ones, both of them beeing especially associated with advanced grinding. The early-stage processing adzes have a superficial grinding and a contoured or poorly contured cutting edge.

The typological variety as large as that of chisels or axes, embodied in very few pieces of one type, denotes a lack of standardization, a poor practice in processing this category of tools. Their production was for domestic needs, not for exchange. In terms of functionality, they could be used in the exploitation of young forests, they were more efficient than the axes in cutting bushes.

III.5. Tools for stone processing

Three types of percutors have been discovered: P1 - massive, spherical, P2 - rounded quadrilateral, P3 - tall, perforated. The first type served the harsh percussion, the other two the pecking. For grinding, stone slabs were used, usually sandstones of different sizes and shapes. Sawing was done using one or two edged stone slabs.

III.6. Tools for grinding cereals

Two types of smashing stone, Z1-spherical type, flattened and Z2-elongated type, were used. The grinders have only one useful face, slightly alveolated or flat.

III.7. Varia

In this category we included the stone balls - most probably used for the sling although one of them has an incipient perforation - and two pieces of uncertain destination.

III.8. The analysis of the polished lithic tools in the archaeological context

It is mainly about three types of contexts that are found in each phase: habitation layer, dwellings and waste pits that we analyzed by using the CA-PCA program.

III.8.1.1. Suplac I level

The preforms for the chisels are the most common elements of the series. The entire operational chain appears and associations show that they could be processed by the same people or groups of people right from the raw material. Processing of chisels is indicated by four series and a cassette. The association axes-chisels appears in two series and a cassette, chisels-adzes in a cassette, and chisels-axes-adzes in a series.

III.8.1.2. Suplac II level

Common elements of the series are cores, preforms for chisels, D1 and D3 chisels, in early or advanced processing. The operational chain is usually complete, especially for chisels and axes. There are more tools for stone processing, especially percutors. The following combinations were obtain on the base of the series: chisels-axes-adzes in eight series, chisels-axes in three series, chisels-adzes in a series, and two other series included only chisels.

III.8.1.3. Suplac III level

The common elements of the series are the preforms for chisels, the early-stage chisels, the waste. The operational chain is usually incomplete, mostly missing the finished pieces. The raw material, that is, the cores are grouped in the VII series that includes cassettes in the NE area of the site. The seriation gave the following combinations: four-series and three-cassettes contained chisels and axes, three series had chisels, axes and adzes, chisels-adzes in a cassette, while three series and three cassettes included only chisels. There is a more pronounced separation in the arrangement of the three categories of tools, although their percentages do not change significantly from the other phases, which in combination with the grouping of the raw material leads to the conclusion that there is a more rigorous organization of processing at this stage.

III.8.2. Discovered in dwellings

Almost every dwelling contained pieces of polished stone. The highest frequency of house processing is found in the Suplac I phase, where most of the dwellings can be considered as workshops, having the most numerous lithic inventories. Only in some of these dwellings the processing of the axes is fully illustrated. There is a regression in the Suplac II phase, the complete operational chain no longer appears in any dwelling, then a reinforcement in the Suplac III phase but with a weaker representation of the processing of axes than in the Suplac phase I. The adzes were processed only accidentally in dwellings.

III.8.3. Discovered in waste pits

Only 17% of the waste pits had ground stone inventory, up to four pieces but usually only one. The series are chronologically mixed, most of them include preforms for chisels. The lithic inventory of the pits offers a truncated image of the processing, yet somewhat similar to the level of each one.

III.8.4. Discovered in other contexts

Few discoveries have occurred in other contexts: the perimeter of river rock agglomerations, foundation structures, hearts, inhumation graves and cenotaphs, pits for extracting clay, aggregation of vessels. In the case of agglomerations of stone, it may be the continuation of processing in the same area, but sporadically. The deposition of polished pieces into foundation trenches, postholes, hearts, graves and cenotaphs is subject to certain ritual practices.

III.9. The chronology of polished lithic tools from Porţ-Corău

The main types and variants of tools appear throughout all the habitation period at Porț, and those that appear in a single chronological phase are too few to assign a chronological value. There are changes in the weight of the types. The D3-type chisels

become the most numerous in the Suplac III phase where the D4-type pieces processing is also intensified. T4-type axes disappear in Suplac III, and T3 types can be said to be more specific to the Suplac II phase. The greatest typological diversification is found in this phase in which the number of axes increases, most types of tesle appear and the percutors are diversified. The dating of polished lithic tools can only be done in a stratigraphic context.

IV. Other sites in northwest Romania

In this chapter we compared the findings from Porț with similar ones within the limits imposed by the current stage of research. The nature of the information was different for the three counties concerned. In the case of Salaj, we were able to examine the unpublished material and consult the excavation documentation. The discoveries in Bihor county were organized in a repertoire chronologically structured by D. Ignat, which we adapted to the typology used in the present paper. The pieces from the territory of Satu Mare county were gathered from site monographs or studies that generally treated the discoveries in a settlement. We mention the sites with more important discoveries. At Zăuan (Salaj county), a processing for the domestic needs, with low skills and standards, was practiced in the settlement belonging to the early Neolithic. The following settlements they all belong to the late Neolithic. At Pericei (Sălaj county) the processing had the same orientation towards exchange as at Porţ, a hypothesis supported by the presence of river rock agglomerations. The chisels prevail, followed by adzes. In the settlement of Tășad (Bihor County) pieces processed at Porţ were imported, possibly the same happened at Bocșa (Sălaj county), in the latter tools from Pericei may also be present if we consider their typology.

V. CONCLUSIONS

V.1. Woodworking tools from Porț

The processing focused on the production of chisels. The use of pecking depended on the difficulty of reaching the shape, so the pecking traces more often appear on the trapezoidal and oval shapes.

V.2. Organizing the processing of polished stone at Porţ in the context of settlement economy

In the Suplac I phase there were dwellings with intensive ground stone processing. Similar levels and dwellings associations emerge, all stages of processing occur in both contexts. In the Suplac phase II, raw material agglomerations also occur, the processing is mainly outside and most often it is mixed, the chisels, the axes and the adzes appear in the same areas. Again we are dealing with intensive processing in the dwellings of the Suplac III phase, but more focused on the chisels while in the outer spaces there is a more pronounced

separation of the processing zones of the main categories of tools but also of some stages of processing.

Most members of the community (probably men only) were involved in the processing of ground stone. Taking into account the good quality of the raw material, grinding more than was strictly necessary for the functioning of the tool and standardization (especially for the chisels) we can consider that there is a high degree of specialization. The same conclusion is reached if we take into account the complexity of the techniques used, especially the pecking, although it is possible that only some craftsmen will master the most complex techniques. The work of ground stone was limited by other activities, generally subsistence ones.

V.3. The dynamics of typology of polished lithic tools in the NW Romania

The fitting of the types of pieces from the sites of Porţ, Pericei, Bocşa, Ţăşad and Zăuan on chronological phases revealed differences between contemporary settlements and similarities between different chronological phases. The Suplac I-III phases of Porț show most of the correspondence given by the general characteristics of the ground stone industry in this settlement. The Perice site, contemporary to Suplac II, is closer to Suplac III fase from Porț because of the trapezoidal predominance and the large procentage of the oval chisels. The latter provide the correspondence of Pericei-Bocsa where the oval type of chisels is the most widespread. The site of Tăşad, contemporary to the Suplac II phase, is slightly closer to the Suplac I phase at Porţ due to the predominance of the rectangular chisels. The Starčevo-Criş contexts (from Zăuan and Porţ) do not show much correspondence with the other sites because of the small number of pieces and the rarity of the unfinished ones.

The large procentage of the pieces under processing must also be attributed to the inconsistency caused by other day-to-day activities. Just because of the lack of time, the Porț craftsmen could use for exchange the unfinished pieces, even preforms. In this regard, we can see that for each stage of processing there is a category of pieces that have similar characteristics. These may represent different standards for the tools to be exchanged.

The classification of the polished lithic tools indicated that there was no evolution in the processing of the stone at Porț, the techniques being mastered from the beginning. It is therefore likely that the settlement in that place was motivated by the search for the raw material and the evolution of the community was closely related to the processing ground stone tools for exchange.

VI. Catalog of the polished lithic tools from Porţ Corău

This chapter presents all the findings of polished stone from Porț, including both the description of the pieces and the stratigraphic and chronological context.

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