January 2020 Number 9 (2020/1)

NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ
Faculty of History

EDITORIAL

Welcome everyone in these crazy times of coronavirus! We are very sorry for the slight delay with the publication of the issue, but the situation quite complicated our reality. In this issue, you will find three papers. The first present our old experimental works with trampling made on the occasion of attempts to interpret the function of interesting Mesolithic tools, i.e. microscrapers. The second text presents an experiment recently carried out, whose purpose was to interpret the type of tool used to decorate one of the Subneolithic harpoons from Šventoji. In the last paper, we describe our latest experiments with various techniques of grinding/polishing bone objects.

In this issue, we also introduce a new type of poster "People of Experiment", where we intend to symbolically honour the most important people for experimental archaeology at NCU. They were both, great researchers and ordinary students, who have significantly contributed to the development of works using this method in our Centre. Happy reading and all of You stay healthy!

Grzegorz Osipowicz

INSIDE THIS ISSUE

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Institute of Archaeology
Nicolaus Copernicus University
Toruń, Poland

People of the experiment

Prof. dr hab. Kazimierz Żurowski (1909-1987†)

Head of the Department of the Archaeology NCU from the 1953 till 1976.

He was the first experimenter in the Institute of Archaeology NCU. In the 1970s Kazimierz Żurowski, started to study the prehistoric and early medieval methods of softening osseous raw materials. His works were pioneering and widely cited in many studies connected to this topic.

If your interested please check:

Żurowski K., 1974. Zmiękczanie poroża i kości stosowane przez wytwórców w Starożytności i we wczesnym średniowieczu, Acta Universitatis Nicolai Copernici, Archeologia 4, p. 3-23, Toruń

Walk, run, jump – experiments with trampling

Influence of post-depositional processes on the condition of the prehistoric artefacts is at the point of interest of archaeologists for a long time. The morphology of the damage resulting from their impact may depends on such factors as among others: the type and chemical composition of the soil, the presence of water or the landform. One of the factors that had an impact on the current state of preservation of prehistoric artefacts was also trampling that took place after their deposition in the ground. Studies on the influence of so-called "trampling" as a post-depositional form of mechanical damage created, among others on flint and stone materials, by people or animals have been carried out for several decades (see Nielsen 1991; Shea, Klenck 1993).

One of the starting points for experimental works carried out at the Institute of Archaeology NCU on the issue of trampling were so-called microscrapers, i.e. flint products found mostly at the Mesolithic sites (Osipowicz 2010). These artefacts bear usually: a single line of retouch built from the scalar scars with feather terminations, rarely preserved polish (usually in the form of a thin, discontinuous line along the edge) and sometimes a slightly rounded working (?) edge (Fig. 1).

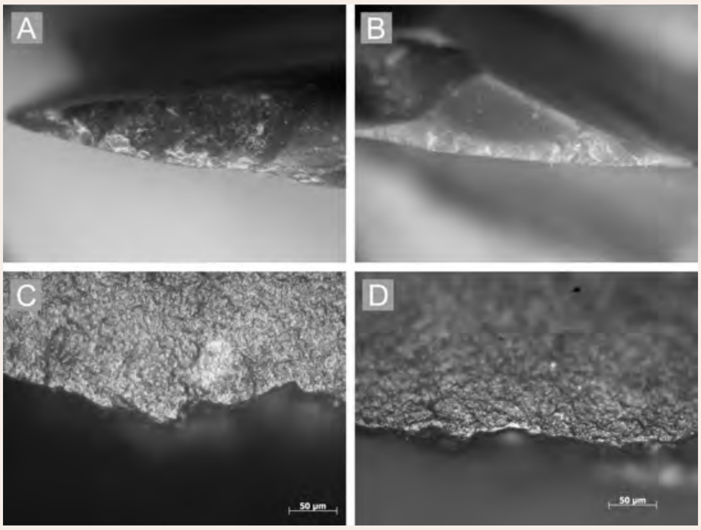

Fig. 1. Ludowice, Wąbrzeźno commune , site 6. Usage traces observed on selected microscrapers: A, B - retouch; C, D - polish (photo G. Osipowicz).

The characteristics of these traces allowed for the hypothesis that these tools were used to process non-woody plant stems and occasional works in a relatively soft raw materials on a 'use and throw away' basis. Due to the weakly developed polish, the questions have raised: is the retouch observed on edges of microscrapes was always created during their use or is its origin can be also post-depositional? Whether in all cases are we dealing here with actual functional tools or perhaps, in some cases these are the geophacts? The possibility of the natural formation of this type of artefacts was tested experimentally.

A special path has been designed for the purpose of the experiment (Fig. 2). It was four meters long and one meter wide. After marking out the shape of the path, the turf was removed from the ground, and then, wooden planks were placed at both long sides of it, to secure the future infill from uncontrollable spreading around. The next step was to divide the path with the use of wooden planks into the four equal sectors with a length of one meter each. Then, all parts were filled with a layer of different material, about 15cm thick. In the case of the first sector, it were the small pebbles with a diameter of about 4-8 cm. The second sector was filled with loose sand, the third one with the gravel with granulation of about 2 cm, and the fourth with clay.

Fig. 2. "Path" prepared for the experiment.

Due to the using different types of flint raw materials in the Stone Age Poland, in the experiment conducted it was decided to test three types of Polish flints: Baltic, Chocolate and Świeciechów one. The sample of the red quartz porphyry was also applied, which was the basic raw material of the stone industry discovered at the Mesolithic site Ludowice 6 (Osipowicz 2013; Osipowicz, Sobkowiak-Tabaka 2014). The same amount of the freshly knapped flakes from the above mentioned raw materials was deposited in each sector of the path (Fig. 3). The flakes were numbered.

The duration of the experiment was planned for the three months, assuming every day, repeated walking at the path. A group of 15 students being a part of our excavation team participated in the experiment. After three months, the flint and stone products were explored, washed and subjected to traceological analyses.

Fig. 3. Flint and stone materials used in experiment.

The results of traceological research of materials which were deposited in the sand and gravel-filled sectors have been already partially published (Osipowicz 2017, 84-86). A brief analysis of flints deposited in gravel has shown that the post-depositional retouches formed in this case are significantly different from those visible at the edges of microscrapers. The situation is slightly different in a case of flints from the part of the path filled with sand. On most of these flakes, no retouch was observed (except some individual, irregular scars). Only, at the edges of two of them, the damage was identified, which to some extent may correspond to the one observed on the microscrapers (Fig. 4). However, the general characteristics of the damages, their distribution, type of scars and the character of the edge is significantly different.

Therefore, it can be suggested with a high degree of probability that the genesis of the retouch observed on artefacts is different than in the case of the above-mentioned experimental flints. It seems that damages visible on were created as a result of relatively long and repetitive events (economic activities?), which resulted in the creation of relatively wide, regular and standardized retouched edges. In the case of experimental flints, we deal with one-time (temporary) events, such as wiping the product with a small stone or retouched during the flake's breakage. The detailed results of the presented studies will be published in full in an independent publication.

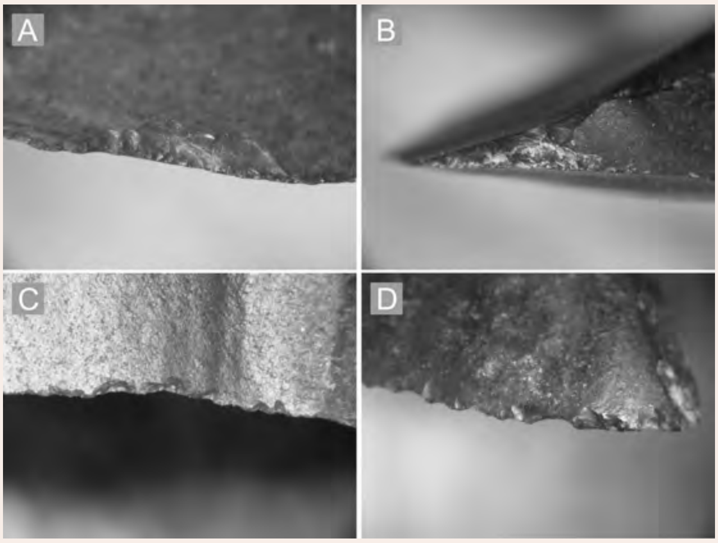

Fig. 4. Retouch of a natural origin produced during the experiment (photo G. Osipowicz).

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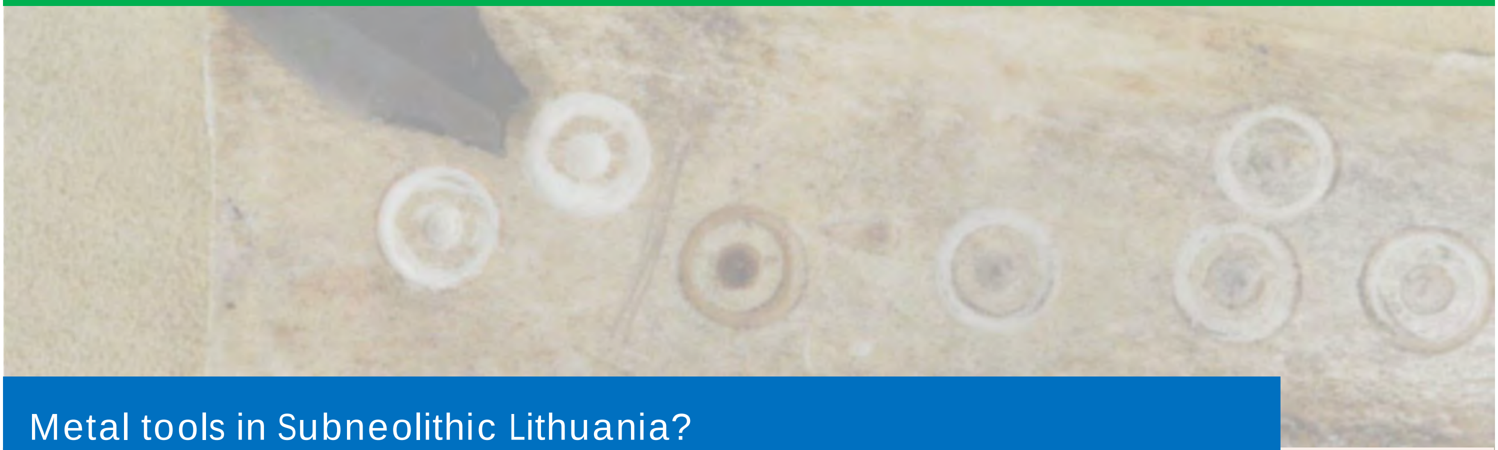
Shea J. J., Klenck J. D. 1993. An Experimental Investigation of the Effects of Trampling on the Results of Lithic Microwear Analysis, Journal of Archaeological Science, 20, p. 175-194.



Metal tools in Subneolithic Lithuania?

Šventoji 6 is an archaeological site situated on a shallow zone or on an island in the former shallow lagoonal lake. It dates to ca. 3500-2500 cal BC and contains unstratified Subneolithic and Neolithic materials, including Globular Amphora Culture pottery. It was probably a pile dwelling site specialised in skin processing (Rimantienė, 2005; Piličiauskas, 2016; Osipowicz et al., 2019). Among the rich prehistoric material obtained during the excavations conducted at the site, a unique bone harpoon made from a large ungulate long bone can be highlighted (Fig. 1). Its surface is decorated with a series of circles (5 on one side and 7 on the other side), lines that link some of them, and independent holes that do not find analogies on artefacts with similar chronology in Europe.

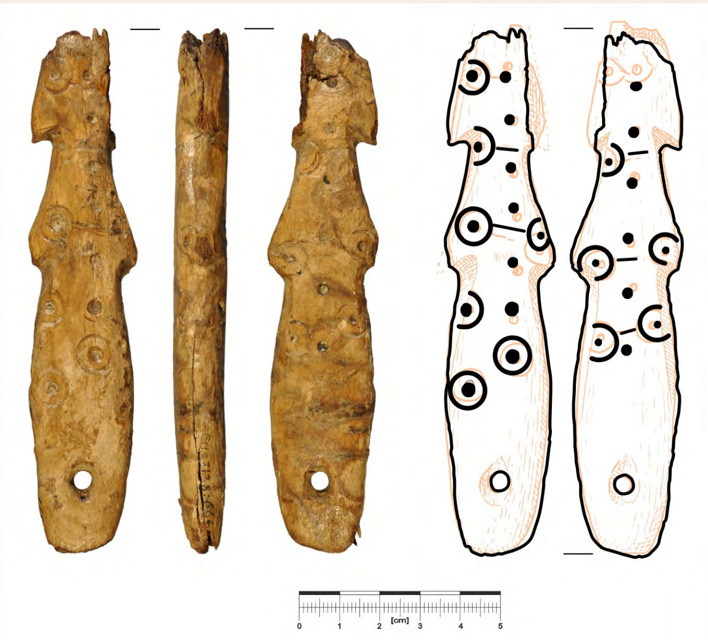


Fig. 1. Ornamented harpoon-head from Šventoji site 6. Drawing on black by J. Orłowska; in the background a drawing after Rimantiene 2005, 389, pav. 276:1. All illustrations in the text are based on Osipowicz et al.. 2020 with changes.

The decoration visible on the harpoon has been intriguing people for a long time and has become the basis for experimental studies (Gaižauskas, 2017). As a result, it was suggested that the ornament was created using lithic implements. The technique applied for making the circles was drilling, most likely using a compass-type borer twisted around one longer tooth (cf. Tomenchuk and Storck, 1997; Gaižauskas, 2017). However, during the traceological analysis of the artefact it was noted that the characteristic of the technological traces observed inside the engravings that make up the circles (their sharpness and highly regular linearity, as shown in Fig. 2) indicate that this motif could not have been made using lithic tools, but the metal ones.

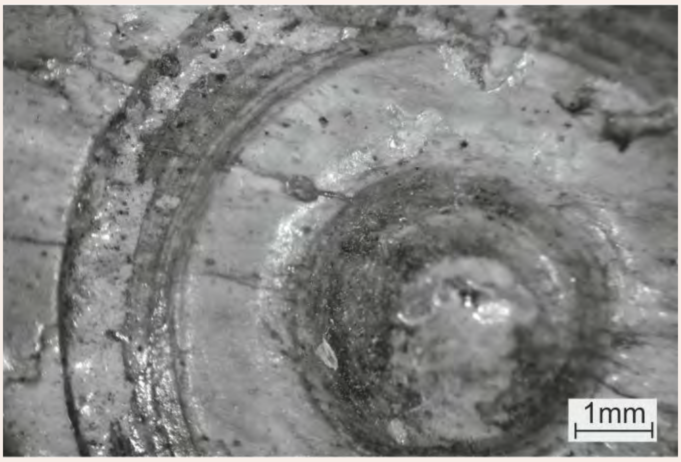


Fig. 2. Technological traces observed in the decoration visible on the harpoon-head from Šventoji 6 (photo G. Osipowicz).

An experimental program was implemented to interpret the decoration method on the harpoon from Šventoji. Two tools were used during the experiment (Fig. 3). The first was a flint blade about 4 cm long, whose working edge was formed (with the use of the copper retoucher) to a "two-spike fork" shape, creating a so-called compass-type borer. The specimen was not hafted. The second tool used was made of a copper rod about 8 cm long and 6 mm in diameter, which was flattened at one end to form an analogous working edge. During the experiment, a Bos Taurus bone (humerus, diaphysis, softened in water for one week) was decorated.

Both tools used in the experiment (flint and the copper) allowed the replication of decoration visible on the harpoon from Šventoji. Six circles were made using the flint and 5 using the metal tool (Fig. 3).

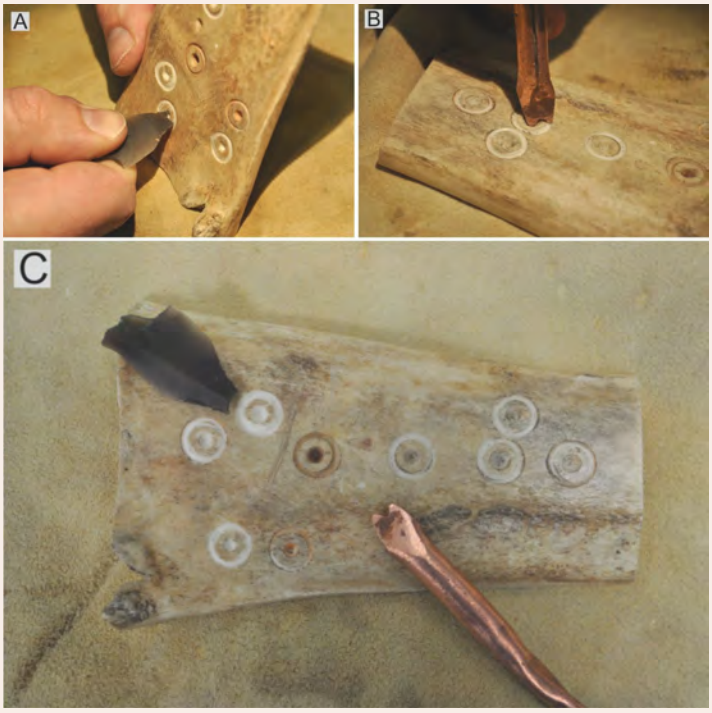


Fig. 3. An experimental attempt to replicate the ornamentation visible on the harpoon-head from Šventoji.

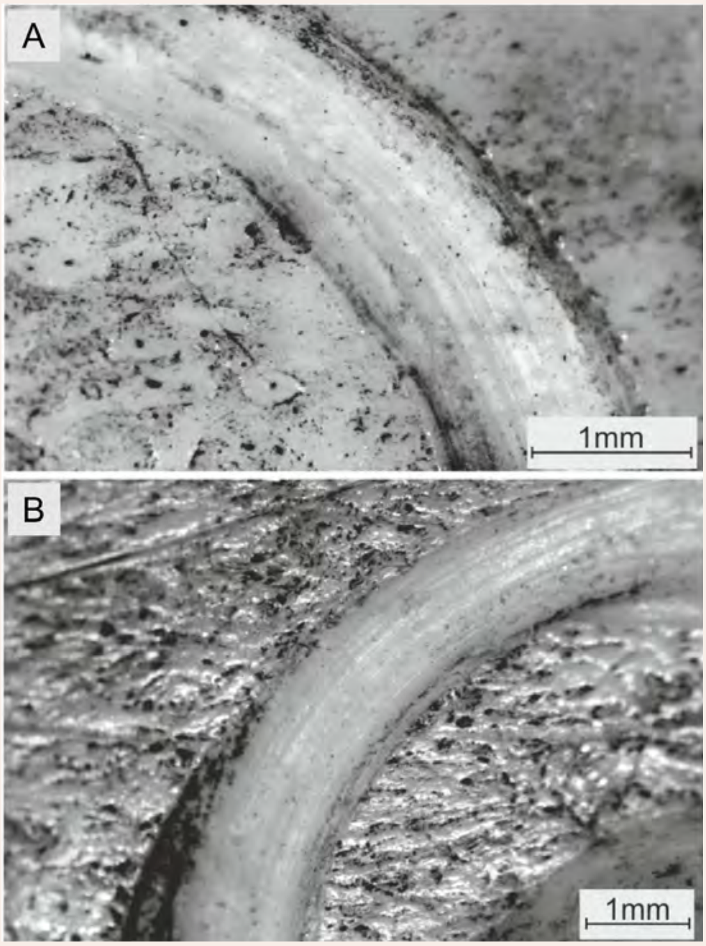


Fig. 4. A - technological traces created with the use of the flint tool; B – technological traces created with the use of the copper tool (photo G. Osipowicz).

However, it was already observed during the work that there was a significant difference between them. The flint tool had to have delicate working edges in order to create adequately thin engravings. Because of this, it required frequent retouching. This had a large impact on the characteristics of the wear traces formed on the bone.

First of all, it caused changes in the width of the engravings and even the diameter of the circles. At the initial stage of using the freshly retouched tool, the engravings were regular (Fig. 4A). However, the circles quickly became very irregular, especially when trying to deepen the engraving, (Fig. 4B) and began to differ significantly. During the experiments, the working edge of the tool had to be corrected twice, which is considered frequent given that it was only used to carve 6 circles.

Further discrepancies were discovered during the analysis of the microscopic traces formed as a result of using both tools. The cross-section of most of the engravings created with the flint product is irregular and U-shaped. Linear traces observed inside them are also irregular, not uniform, deep, and often cross over (Fig. 4C). With the metal tool, the situation is different. The cross-section of the engravings is close to a rectangle, with a flat bottom (Fig. 4D). Linear traces visible inside them are highly uniform (Fig. 4E). In most cases, these are regular linear bands made up of several parallel hair-like striations, with previous traces removed by each subsequent band (Fig. 4F).

Taking it into consideration it can be suggested with quite high probability that the decoration visible on the harpoon head from Šventoji 6 was made with the use of metal tools. It creates a lot of questions because in this period such tools are not known from Lithuania. More information about this issue, but also precise information about the results of summarized here analysis can be found in the article:

Osipowicz G., Orłowska J., Piličiauskas G., Piličiauskienė G., Rannamäe E., Cyrek K., Sylwestrzak M. 2020. "Stone Age technologies and human behaviors as reflected in decoration of osseous artefacts from the northern part of East-Central Europe". Quaternary International. https://doi.org/10.1016/j.quaint.2020.04.014

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Osipowicz, G, Piličiauskas, G, Piličiauskienė, G, Bosiak, M, 2019. Seal scrapers" from Šventoji: in search of their possible function. J. Archaeol. Sci.: Report 27, 1–12. doi:10.1016/j.jasrep.2019.101928.

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Rimantienė, R, 2005. Die Steinzeitfischer an der Ostseelagune in Litauen. Forschungen in Šventoji und Būtingė. Litauniches National Museum, Vilnius

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VOLUNTEERING IN EXCAVATIONS AT MESOLITHIC SITE




We warmly invite You to participate as a volunteer in the excavations conducted under the research program “Mesolithic Communities of the Chełmno-Dobrzyń Lakeland – daily life, mobility, external contacts and relationships with the environment”.

The excavations will take place in July and August 2020 at site Paliwodzizna 29, which is located in the subglacial valley of Grodno and Plebanka lakes (about 40 km from Toruń, central Poland). It will be the fourth season of excavations here, during which numerous remains of the perfectly preserved Mesolithic and Late Palaeolithic features have been discovered. The excavations will be conducted in three areas of the site: (1) the top part of the hill located at the site, where a complex of the Mesolithic features (hearths and pits) of the ritual origin was discovered including a possible grave (last season the feature was secured before the final exploration due to lack of time) and (2) in the western part of the site. In the previous season, exploration of a cluster of the materials related to the Late Mesolithic Chojnice-Pieńki (post-Maglemose) culture began here. In addition, the wet part of the site (the coastal zone of the former lake) will be explored, where an undisturbed system of layers dated from the Late Glacial to the end of the Atlantic period of Holocene was discovered. The archaeological sources from the organic raw materials can be found here. The side was use during the entire Mesolithic, but most interesting phase can be dated to the Preboreal and represent one of the earliest Mesolithic settlements in Poland (perhaps even connected to the Palaeolithic background). Differentiation of the sediments that are excavated on the site, guarantees the versatility of education gained during the excavations and ability to discover the unique archaeological artefacts. Detailed information about the project can be found at the website: www.searchingformesolithic.umk.pl
The short movie presenting archaeological survey from the year 2018 can be found here: https://www.youtube.com/watch?v=DUqTmIxchSM

Volunteers participating in the study are guaranteed a **free accommodation** in the expedition base. The cost of **catering** is **15€ per week**.

All interested please contact with dr hab. Grzegorz Osipowicz, prof. NCU by e-mail address: **grezegor@umk.pl**







YOU ARE VERY WELCOME!

Experiments with different kinds of grinding techniques applied to worked bone materials

The possible evidence of bone tool shaping using the grinding technique is already known from Lower Palaeolithic sites in Africa and appear to be unchanged in its general form until the end of the Neolithic period in Europe. In prehistory, grinding was performed mostly with different kinds of stone slabs, which served as a kind of abrasive tool (Fig. 1).

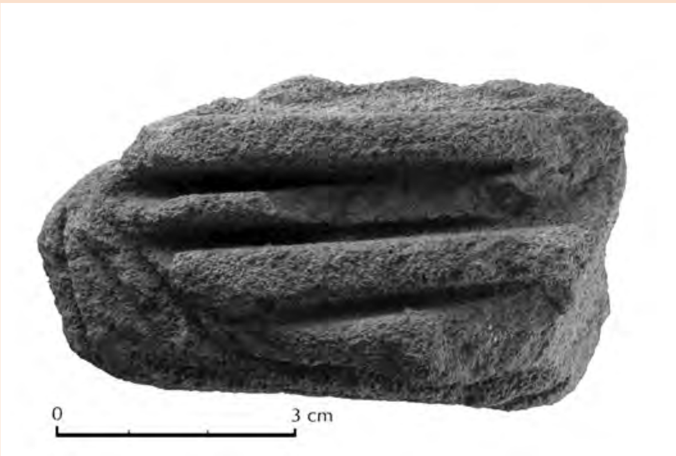

Fig. 1. Example of grinding, polishing sandstone with grooves from the Magdalenian site of Duruthy (Sorde, Landes, France; http://journals.openedition.org/paleo/docannexe/image/2460/img-4.jpg)

However, the differences between many identified traces observed on bone objects described as a result of grinding (Fig. 2) still raise many questions about used materials and techniques. This is why, we have begun an experimental program which the main objective was to classify, analyse, interpret and correlate the macro and microscopic traces formed on the experimentally worked bone materials, caused by different kind of grinding techniques.

The main goal of the presented study focused on the experimental works, microscopic analysis, and a detailed description of the traces left by grinding on the bone surface. As M. Newcomer (1974) suggests a major problem with conducting experimental research on the technology of bone tools is that many different manufacturing techniques and tools can be used to achieve the same or very similar effect. This is why, during the experiments conducted directly for the purpose of this project, a wide variety of abrasion methods were tested, taking into the account many possible variables, such as the kind of grinding slab, potential admixtures, the type of motion and the duration of work. The effectiveness and suitability of the investigated methods and materials were also examined.

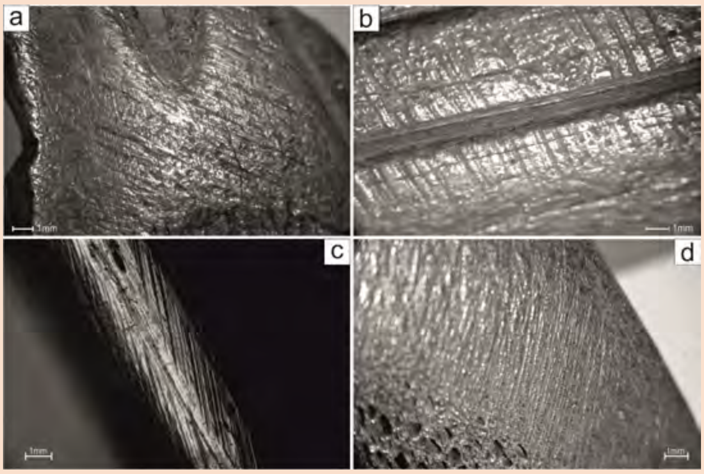

Fig. 2. Examples of grinding traces identified on selected osseous artefacts from Polish Lowland dated to Late Palaeolithic/Mesolithic (photo J. Orłowska).

During experiment fragments of red deer (Cervus elaphus) long bones (metapodials) were used which were divided into blanks (average 2 cm width and 5 cm long). Grinding was applied on the external surface of the bone. Five different types of stone were used, which varied with grain size and toughness: yellow quartz sandstone, red quartzite sandstone, quartzite and two kinds of gneiss. In each case, the bone was ground with and without water. Additionally was also tested admixture in a form of dry and wet sand (Fig. 3).

Conducted experiments resulted in many observations on both, the effectiveness of type of stone used and the working technique.

Fig. 3. Experimental works (photo J. Orłowska).

Conducted experiments resulted in many observations on both, the effectiveness of type of stone used and the working technique. For example, during our works, grinding was most successful when both, stone and bone surface was dry. Grinding bone on a wet surface increased slippage and reduced the amount of material removed. It also caused the bone debris to adhere to the stone slab which reduced its grinding efficiency. When the bone and the stone were dry most of the debris could be blown away or rubbed off with the hand.

An important element was the hardness, porosity and granularity of the stone slab, which reflected into the efficiency of work and the final shape of the processed surface. Adding admixture of dry or wet sand between piece of bone and a stone slab also changed the effectiveness of work and final morphology of the worked bone surface. In the case of admixture of dry sand, the biggest problem was its maintenance on the stone surface, because after a few moves it "escaped" from under the processed bone. If the amount of the sand was to small the bone slipped out of the stone slab. The situation was much better with wet sand, which adhered better to the stone surface and actually created additional friction.

Each type of stone and technique of grinding used changed worked bone surface. What important, technological traces visible on different bones suggest the presence of characteristic macro- and micro-wear patterns (Fig. 4) associated with many variables.

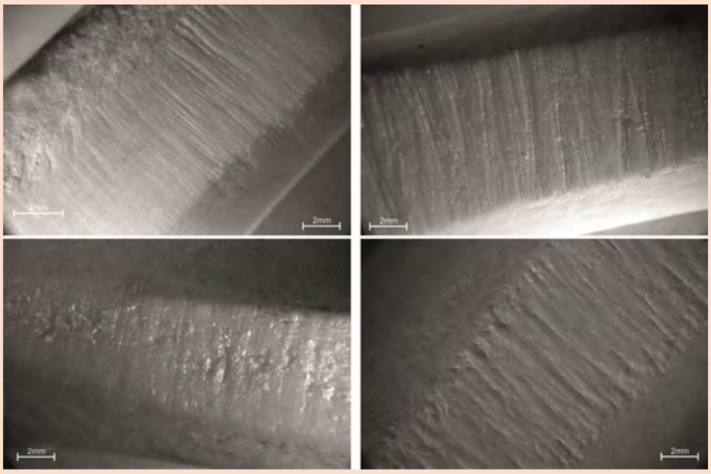

Fig. 4. Examples of grinding traces formed on bone during performed experiments (photo J. Orłowska).

The next step of our study will be focused on detailed description and interpretation of obtained data, which will be also compared with selected osseous archaeological materials. We hope to present the detailed results of these experiments soon in a proper publication :)

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Newcomer M. 1974. Study and replication of bone tools from Ksar Akil (Lebanon), World Archaeology 6, 138–53.

Our recent publications

Grzegorz Osipowicz, Justyna Orłowska, Gytis Piličiauskas, Giedre Piličiauskienė, Eve Rannamae, Krzysztof Cyrek, Marcin Sylwestrzak

STONE AGE TECHNOLOGIES AND HUMAN BEHAVIORS AS REFLECTED IN DECORATION OF OSSEOUS ARTEFACTS FROM THE NORTHERN PART OF EAST-CENTRAL EUROPE


Quaternary International

Stone Age technologies and human behaviors as reflected in decoration of osseous artefacts from the northern part of East-Central Europe

Abstract: This article presents the results of traceological studies of ornaments observed on selected prehistoric osseous products from Poland and Lithuania. Included are unique artefacts from this region dated to the Late Palaeolithic, Mesolithic and Neolithic, or which are connected to Subneolithic communities. The article presents the results of analyses focused on interpreting the applied decorative techniques and tools employed in making the ornaments. n some cases, the use of metal tools, rare or unknown in a given area, is suggested, which presents a significant impact on the interpretation of the socio-cultural nature. An attempt is also made to identify the roles of symbolic features hidden in the way the ornaments were created or how they were treated afterwards. For the analysis of the artefacts, stereomicroscopes, SEM, computed tomography and optical coherence tomography (OCT) have been used.

In Journal: Quaternary International (2020); https://doi.org/10.1016/j.quaint.2020.04.014

Other News

Dear all interested in the
International Camp of Experimental Archaeology,
Toruń 2020.

We are almost ready for our camp, we have the materials, castle for the base, program of the seminar and of course a lot of good thoughts! Unfortunately, the coronavirus that probably messes a lot in Your life (the same as in ours) has also the influence on our Event. Yesterday our University decided that all conferences that are planned on the period before June 30 must be cancelled or moved to some other period. We can't discuss with this ordinance, so, the only possibility is to plan the camp for some other dates. Right now we discuss the possibilities with the participants of the Event.
We will keep you updated on all arrangements and changes.
On behalf of the Camp Organisational Committee
With my best regards and stay healthy!
Grzegorz Osipowicz