NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ
Faculty of History

Society for Experimental Prehistoric Archaeology

EDITORIAL

Dear Readers, welcome after the summer holidays! We apologize for the delay in publishing this issue of the Newsletter. It resulted from several factors but above all the extension of the duration of our excavations from 2 to 4 months :-). Organizational works related to the International Camp of Experimental Archaeology planned by us at the turn of spring and summer next year, which we wanted to inform you about right now, also had an impact on this situation. This issue of our Newsletter is entirely dedicated to the experimental work carried out during this year's excavations. A large group of volunteers from many European countries participated in them, and we would like to thank them for their huge commitment in both excavations and experiments! As always, we hope that you will like the texts contained in this issue. On behalf of the entire editorial team

News

Experimental Camp in Poland!!!

We invite you to participate in the International Camp of Experimental Archeology! More on page 2 of our Newsletter!

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INSIDE THIS ISSUE

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International Camp of Experimental Archaeology

Toruń 2020

We invite everyone interested in experimental archaeology to participate in a two-week ***International Camp of Experimental Archaeology***, connected with a seminar presenting the state of art of this method in Poland and accompanying traceological workshops.

The event is organized by the Department of Prehistory of the Institute of Archaeology, Nicolaus Copernicus University in Toruń, in cooperation with the Society for Experimental Prehistoric Archaeology (SEPA).

Papers presented during the seminar and the results of experimental work carried out during the camp will be published in the book entitled ***Experimental Archaeology in Poland***. The event is directed primarily to archaeology students and PhD students who want to deepen the knowledge in the field of experimental archaeology, as well as people interested in the traceological method.

The number of places is limited!

Date of the camp
15-27 June 2020

More information about the camp, including the number of places and fees, can be found on the event website: **http://www.exarchcamp.umk.pl**

NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ

My first experience in Polish experimental archaeology

Below you can find a short letter written by Stefano Mercurio, student of the Sapienza Università di Roma in Italy, who was a volunteer during the excavations at the Mesolithic site Paliwodzizna 29 in 2019, led by Grzegorz Osipowicz from the Institute of Archaeology, NCU in Toruń. Excavations took place from the end of June to the end of August and were a part of project MESOLITHIC COMMUNITIES OF THE CHEŁMNO-DOBRZYŃ LAKELAND – daily life, mobility, external contacts and relationships with the environment, funded by the National Science Center in Cracow, Poland (project no. 2016/23/B/HS3/0068; web-site: www.searchingformesolithic.umk.pl). During the excavations, Stefano had an opportunity to be a part of many experimental works, which are described in other articles included in this issue. He had also a possibility to try flint knapping for the first time :) Stefano, we hope that You enjoyed the work with us because we have enjoyed Your company very much! :-)

Newsletter Team

The letter from Stefano:

Stefano Mercurio

As soon as I arrived in the excavation camp, I immediately learned how much it was imbued with the experimental archaeology.

My first occasion to test myself in this field was participation in experiments associated with tanning the deer hide. First, my work involved removing a layer of fat from the fresh hide with the help of tools prepared from animal ribs. The tested tanning method involved using the animal brains as a tanning substance, so we had to prepare a proper substance from pigs' brains and cover with it the clean hide. After one week of soaking the hide in "brain pulp", I had an occasion to try to pull the skin to become softer. It was a great fun and we did all our best to make all of that work successful.

My second opportunity to take part in the experimental works was connected with the project "Bruszczewo knives". The first step of these works was associated with the process of making these unique tools. I have passed to make the replicas of the "knives", that involved among others fleshing of pork scapula with a flint blade. Once the meat was removed, it was necessary to cut with the flint blade a piece of the bone to obtain the sharp side of the future tool that should resemble a semi-lunar knife. In the meantime, any cracks or changes in the flint blade and the time needed for experiment was recorded with the help of specially prepared documentation cards. After that, it was finally time to grind the sides of the tools with the sandstone. Maintaining an acute angle of grinding, ground sides of the tools became thinner and thinner. I had to leave some unpolished area for easier gripping the instrument and then the work was done. It was really interesting to see how the flint tools work with bone and how the unique bone tools from Bruszczewo were probably made.

Stefano during various experimental works during the excavations : A- hide processing;; B - cleaning the pigs scapulas from meat; C - flint knapping.

I have to say that I really appreciated this experimental training session in Poland. They made me learn a lot about experimental archaeology. I would like to thank the organizers and the whole team. Greetings and hope to see you soon :)

Experiments with the manufacture and use of Mesolithic bevel-ended tools made of bone

Bevel-ended tools such as adzes made of metapodial bones of bos/bison species are quite exceptional archaeological finds and usually come from the early Holocene hunter-gatherers' wetland sites located at the European Lowlands. Their blades are formed at the angle of about 30-45 degrees and the holes for a shaft are drilled/pierced through the articular surface of proximal part of the bone. In Poland, tools of this type come from such sites as Krzyż Wielkopolski 7, Trudna, Góra Orle and Borki (fig. 1).

Fig. 1. Selection of the Mesolithic bevel-ended tools from Poland: A - Góra Orle; B - Rybienko Nowe (phot. J. Orłowska).

The technological traces observed on selected artefacts indicate that the blades of tools were finished (or generally made as it is sometimes suggested - see David 2005, 199) by scraping and the holes visible at the proximal ends were created with the nicking technique (fig. 2).

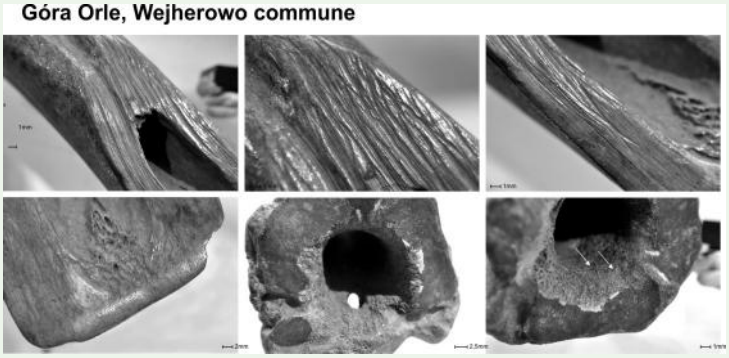


Fig. 2. Example of technological traces observed on tool from Góra Orle (phot. J. Orłowska).

We have already conducted an experimental program aiming at the interpretation of possible function of the similar Mesolithic tools made of red deer antler. During these experiments, a wide variety of household activities were tested, taking into account many possible variables, such as kind of worked material, type of activity performed and duration of the work (Orłowska, Osipowicz 2017).

The new experimental program that we have planned for the tools made of metapodial bones was quite similar in the main aims, but we have decided to test also some current hypothesis about their production. One of them was the idea to recreate and test the technological chaine operatoire (fig. 3) presented by Eva David that is based on the finds from such sites like Mullerup I and Ulkestrup Lyng Øst II in Denmark (David 2005, p. 1999, fig. 119). This part of our works will be described shortly below.

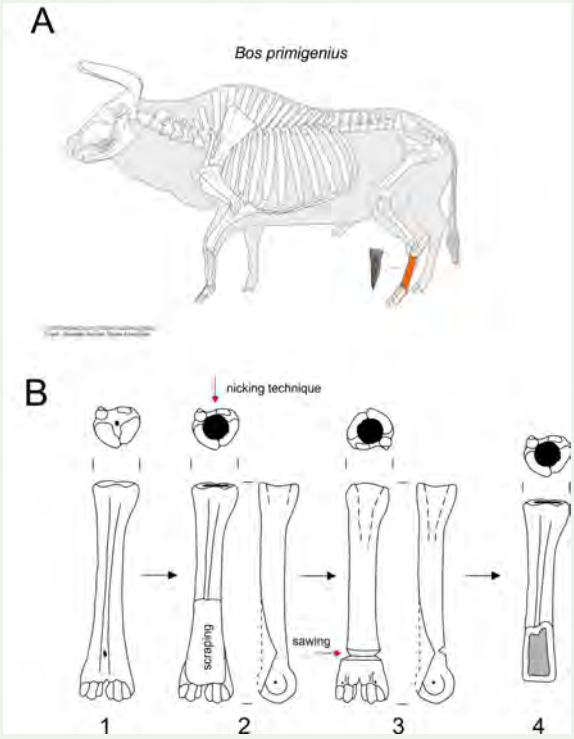


Fig. 3. A - bones of which bevel-ended tools are commonly made; B - reconstruction of chaine operatoire of their production (after David 2005, fig. 119).

During our works, we used softened red deer bones. As usually in such cases, we had to start from cleaning the bones from remains of hide, fat and meat. We used flint blades here. When we finally obtained clean bones, we have started the creation of the future working edges of tools using (as it is suggested by E. David) scraping technique. This process was time-consuming. Bones were scraped on their lower end of diaphysis on their anatomic cranial face. After about 40 minutes of scraping, some of us reached the medullary canals and the bevelled edges of tools began to form. After 70 minutes of scraping, one of the participants reached a bone surface under the medullary canal and was able to cut the bone across in the thinnest part of the scraped surface. The distal end of bone was removed by flexion break and after that, the tool got its final shape.

Fig. 4. Defleshing and cleaning of the red deer's leg bones with the flint tools.

Fig. 5. Scraping a bone with the flint blade.

Fig. 6. View at the profile of the tool and created bevel end.

Fig. 7. View at the tool after removing the distal end of the bone.

It`s important to say, that during the work, first doubts and question aroused about the real efficiency of this method taking into account for example (but not only) the size and form of flint tools used by Mesolithic people and the size of some bone tools of this type. During our experiment, we have used nice and large flint blades, that should be considered as really exceptional finds at Polish Mesolithic sites. That is why it is difficult to discuss the effectiveness of the method in this case. In future, we are going to verify our results using different types of tools of the more "Mesolithic" profile. For now, the method seems to be useful from the point of view of the task, but not necessarily effective and plausible if one look on the problem from the point of view of the Polish Mesolithic reality.

The future steps of our experiments in this regard will be also associated with the interpreting the ways of using this type of forms in prehistory and their usefulness for various activities. In the meantime, we are going to publish the article presenting the results of traceological studies of the selected Mesolithic bevel-ended tools from Polish sites (Orłowska, Osipowicz 2019).

References :

David, É. 2005. Technologie osseuse des derniers chasseurs préhistoriques en Europe du Nord (Xe-VIIIe millénaires avant J.- C.): Le Maglemosien et les technocomplexes du Mésolithique. Ph.D. Monograph (Nanterre 2003).

Orłowska, J., Osipowicz, G. 2017. Searching for the function of the early Holocene heavy duty bevel-ended tools. Remarks from experimental and use-wear studies. Archaeology of the Eurasian Steppes 4, 103-121.

Orłowska, J., Osipowicz, G. 2019. Mesolithic bone adzes and mattock-heads from Poland. Some suggestions on their technology and function. In: Proceedings of AWRANA 2018 Beyond use-wear traces: tools and people (in press).

Bronze Age bone "knives" from Bruszczewo - on the way to understand their function

The starting point for the performed experiments was a collection of unique artefacts made of animal scapula, discovered at the Bronze Age site in Bruszczewo (Poland).

Fig. 1. Examples of bone „knives" from Bruszczewo.

Through technological studies, a number of repetitive traces being the result of tools formation have been observed on the surface of artefacts. It allowed reconstructing the chain of operations conducted during the production process of the artefacts of this type.

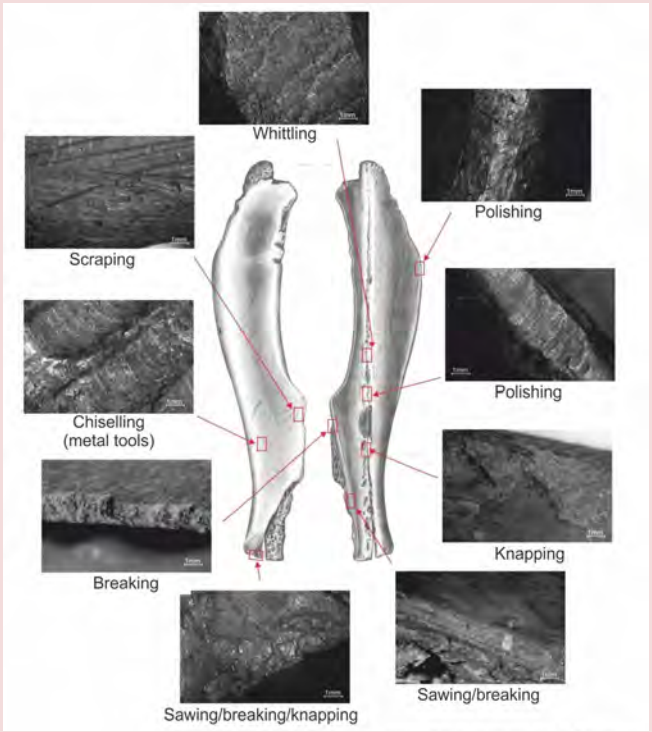


Fig. 2. The examples of the technological traces identified on the Bruszczewo bone „knives"

Some of the traces were certainly made with the use of metal tools. The chain of operations involved:

1. Removing the articular socket by hitting, splitting or sawing / breaking;

2. Removing the spatula comb using hitting, scraping / planning or grinding;

3. Forming of the tool handle from the caesal part of caudal edges;

4. Forming of the two working edges at the caudal part of the scapula;

5. Forming of the working edges in the cephalic and tip parts of the blade.

During the first stage of the experimental works, we tried to apply this operational chain to produce as many replicas of original tools as it was possible and in the same moment to test its effectivity. Our experiments in this regard looked this way:

The works started from cleaning of the fresh pig scapula of meat and fat. We used flint blades here. When all bones were already cleaned, we started to recreate the operational chain described above. First, we removed the articular socket from the scapula, hitting the bone in a proper place with a metal knife and breaking off the unwanted part. In a similar way we removed also the spatula comb.

Fig. 3. Cleaning the pigs scapulas from meat with the flint tools.

Fig. 4. Removing the articular socket of the scapula by hitting with the use of metal knive.

Next step was creating the proper shape of the working edge. For this purpose we had to cut-off the caesal part of the caudal edge of scapula with the use of flint blades.

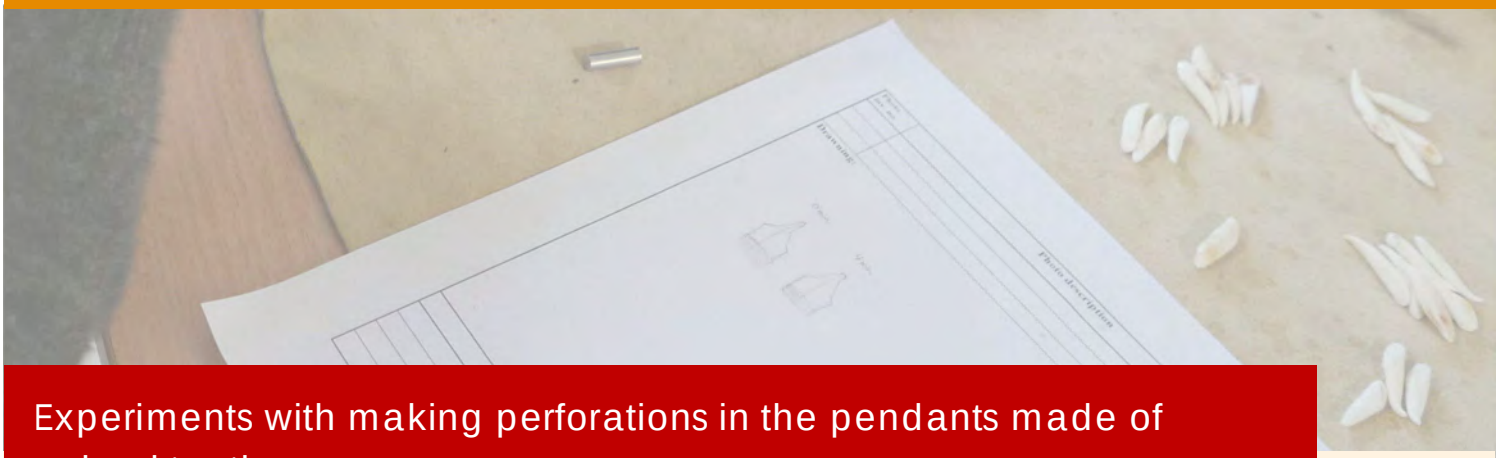
Fig. 5. Removing the caesal part of the caudal edge of scapula with the use of flint blades.

The process was finished by splitting the sawed surface or breaking. After forming the general shape of the tool, a few “teeth” on the upper part of the working edge of each product were created, which are characteristic for this type of artefacts. The last step of work was to remove the unevenness on the bone and finish the working edges with a grinding slab.

Fig. 6. Removing the unevenness on the bones with grinding slab.

Fig. 7. Example of finished replicas of the „knives” from Bruszczewo.

Finished replicas of "Bruszczewo knives" are waiting now for the next step of experiments, which will be aimed to interpret the way they were used. We plan to test them for various activities and work in different materials, i.e. flax, wool, textiles, and leather. We will test also their possible use in the dyeing processes. We hope to present the results of these experiments in the next number of our Newsletter and prepare the publication about the possible function of the "Bruszczewo knives" this year yet.



Experiments with making perforations in the pendants made of animal teeth

Recently, we have finished the traceological analyzes of pendants made of animal teeth, which were found at the Subneolithic-Neolithic sites in Šventoji, Lithuania. The main goal of the traceological and experimental studies associated with these artefacts was to answer the question of how animal teeth were modified to create the pendants i.e. what techniques and tools have been applied for this purpose. Another aspect was the use-wear analysis aimed at determining whether the tooth pendants from Šventoji were used, and if so, what was their real function? How were they mounted to the clothes? Et cetera...

Fig. 1. A selection of the animal teeth pendants found at the sites in Šventoji Šventoji, Lithuania (Fot. J. Orłowska).

As it appeared after microscopic analysis, the technological traces observed on these artefacts include generally only the traces associated with making the perforations inside them. From this point of view the artefacts can be divided in the groups of specimens with: drilled holes, scraped holes and perforations made with the use of both techniques.

Last year, we focused our experiments on the potential ways of use of pendants in the types discovered in Šventoji. We used-them as the elements of cloths, bracelets and independent

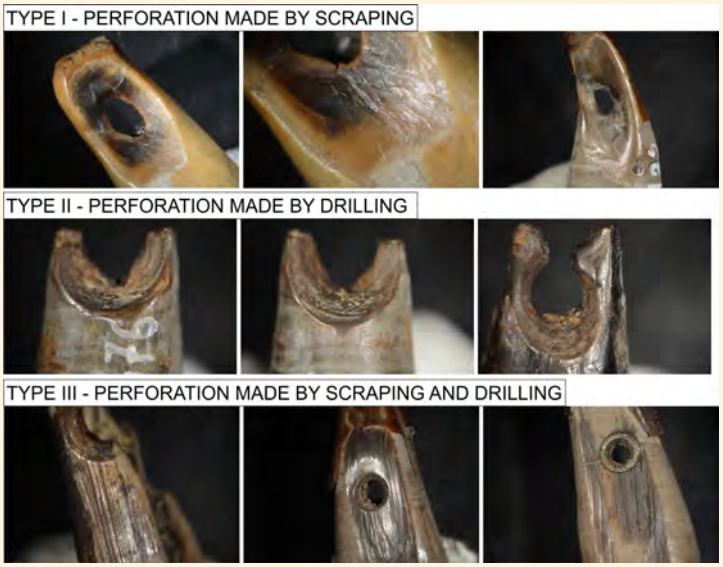


Fig. 2. Examples of the technological traces observed on pendants from Šventoji (Fot. G. Osipowicz).

pendants (you can find short information about this experiment in the number 3/2018 of our Newsletter).

Fig. 3. Our previous experimental program connected with the potencial ways of use of the teeth pendants.

This year, we continued the works in this issue concentrating our point of interest at the methods of making holes inside the pendants.

For the needs of these experiments, short incisors, deciduous incisors and cuspids were obtained from a wild boar species (Sus scrofa) – 64 teeth in total. Holes were made using several options of the bilateral drilling technique, in analogy to ones observed at the artefacts from Šventoji. We have used different kinds of flint tools that served as borers. Holes were made by drilling with a flint tool, which was kept in hand, or with the tool mounted at bow or pump drill. Teeth's were kept at the table, they were laying at doeskin.

Fig. 4. Preparing of the experimental cards.

During drilling with the bow drill, one person was keeping the teeth to make it stable, second one was drilling. Two other methods were perfectly performed only by one person. Drilling with bow and pump drill was very effective. Experiments were a great occasion for observing how each type of tool works and how efficient it is.

After obtain dozens of experimentally made objects, all of them were studied traceologically. Results of these analyses served as an important part of our studies concerning pendants from Šventoji and we hope that they will be published soon :)

Fig. 6. Volunteers during the experimental works :)

References :

Osipowicz G., Piličiauskienė G., Orłowska J., Piličiauskas G. 2019. An occasional ornament, part of clothes or just a gift for ancestors? The results of traceological studies of teeth pendants from the Subneolithic-Neolithic sites in Šventoji, Lithuania. Journal of Archaeological Sciences: Reports (in press).

Fig. 5. Drilling in the teeth with pump-drill.

Experiments with hide tanning

During the excavations, a group of students undertook to experiment with the processing of raw red deer hide. They intended to test in this regard the usefulness of the so-called "bevel-ended tools" and bone "beamers". However, the primary objective of this work was to test the brain tanning method. All experimental works related to the tanning process were carried out in the following steps:

Step 1 - Frame construction

The frame was built from young pines trunks which were tied together with strings. Next, the holes around the circuit of the hide were made. After that, the hide was attached to the frame with strings and tightened up. One pine branch was placed under the hide in the middle of the frame to stretch it additionally during cleaning.

Fig. 1. Fresh skin of red deer on a wooden frame.

Step 2 - Fleshing the hide

For this purpose, two bevel-ended tools made from long bones of a red deer were used. Work was started from the top of the hide. It was important to keep the hide wet during the process. Fleshing lasted about 4 hours.

Fig. 2. Fleshing the hide with the use of bone tools.

Step 3 – Cleaning

The hide was removed from the frame. Then, with the use of flint tools, we cut off the unnecessary edges along with the rest of the flesh. At the end of this step, the hide was thoroughly washed out.

Step 4 - Leaching

A solution of wood ash and water (lye) was prepared in proportion: 2 kg of ash per 15 litres of water. The hide was put into the container and completely immersed during soaking, loaded with the stones. It was checked daily whether the hair can be easily removed. After 4 days hair could be pulled out without any effort so the hide was taken out the solution and washed.

Fig. 3. Preparing the solution of wood ash and water.

Step 5 – Hair removal

For this step two “beamers” made of cow ribs were used. It was important to do it with a grain layer of skin – the hide would not absorb the tannin if we left this layer. The “beamers” were very effective and after 2 hours hair was removed. Finally, hide was washed and squeezed.

Fig. 4. Removing the hair from the hide.

Fig. 5. Removing the rest of the grain layer of the sking with bone tools.

Step 6 - Brain tanning

As a natural tanning method, we used a mixture of 2 pigs brains and 2 litres of warm water. First, the mixture was rubbed into the outer surface of the hide (the one that had fur) to allow the pores located here to distribute the tannin into the hide. After that, the entire hide was immersed in the mixture and left in container for 24 hours. After that it was washed thoroughly.

Step 7 - Drying, stretching and softening

When the hide was washed, it was thoroughly squeezed out of the water. During squeezing it was stretched by hand on all sides. The hide must dry slowly and be stretched all the time when it's drying. Unfortunately, we stopped doing it too quickly so the hide became a little bit too hard.

Fig. 6. Covering the clean hide with brain tanning mixture.

Fig. 7. Squeezing the hide.

Fig. 8. Softened hide.

Unfortunately, due to lack of time, we were unable to conduct the smoking of the hide which is the last step of the entire process, but the works performed were very inspiring and we will continue them in the near future.

Our recent publications

Grzegorz Osipowicz, Gytis Piličiauskas, Giedrė Piličiauskienė, Mariusz Bosiak

"SEAL SCRAPERS" FROM ŠVENTOJI -IN SEARCH OF THEIR POSSIBLE FUNCTION

Abstract: During the excavations carried out at the complex of Subneolitic-Neolithic sites in Šventoji, coastal Lithuania (sites 1, 4, 6 and 23), 27 unique bone products have been discovered. Due to the character of the use-wear and technological traces which are macroscopically readable on their surface they have been defined as scrapers. Dated to ca. 3000 cal BC, these tools are made of harp seal tibia, about 75% of them from right side bones. This article describes the procedure that was conducted in order to interpret the technology of production, ways of use and possible functions of these tools, and includes the experimental program directed to the activities which could have been carried out with such products within the specialized camps of Šventoji, such as processing of animal hides (including seal) with admixture of ochre or ash and fish scraping. The basis for the interpretations is the results of traceological and chemical (SEM-EDX) analysis of the artefacts and experimental tools. As a result of the conducted studies, it was found that the analysed tools were most probably used for scraping the hides with the use of an ochre admixture. The presented research probably concludes a long period of speculations about the functions of these unique objects.

In Journal: Journal of Archaeological Science: Reports 27:1-12**;** https://doi.org/10.1016/j.jasrep.2019.101928

It happened in the past

The Scientific Picnic *of the Polish Radio and the Copernicus Scientific Centre is Europe's largest outdoor event popularizing science. It takes place every year since 1997, in Warsaw, every time attracting crowds of visitors. In 2005 it was honored by the European Commission as one of 10 model European projects in the field of "Science and society". It was an inspiration to many initiatives popularizing science, among others to the creation of the Copernicus Science Centre in Warsaw. Scientific institutions, universities, research institutes, museums and cultural institutions, foundations associated with science as well as scientific circles present their achievements here and reveal the backstage of their daily work. They present science in a manner understandable to recipients at every age, using experiments, demonstrations, often also interactive exhibits. During the Picnic represented are various scientific disciplines, natural sciences, social sciences, and humanities.*

The Society for Experimental Prehistoric Archaeology had the opportunity to present itself during the IXth Picnic of the Polish Radio BIS which took place on June 4, 2005. We received the 2nd prize for the most interesting scientific stall together with the District Museum in Brodnica :)