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NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ
Faculty of History

EDITORIAL

Welcome after the holidays! At the beginning I have to apologize for the delay in publishing this number. In addition to being experimental archaeologists, we are also archeologists in the classic sense of the word, and this summer we had long and very successful, but nonetheless laborious, excavation campaign. Unfortunately, it prevented us from doing the work related to the Newsletter on time. Now, we are back and we hope that the content of this number will be interesting for all those involved in experimental archeology. We start still in a holiday way, from the relation of one of the volunteers participating in our excavations, about the experimental works that he had a chance to do with us during the summer. His opinion is a kind of "look from outside" on our work, what is undoubtedly valuable. The second of the texts concerns more serious issues, ie experiments with method of searching for illegible prehistoric hearths, basing on the distribution of overheated artefacts. The third article presents our experiments aimed at the interpretation of function of the extremely interesting bone tools from a very important complex of prehistoric sites, so called "seal scrapers" from Šventoji. The fourth of the stories tells about our first experiences with the processing of fish hides, and the last one is the relation from two important conferences in which we participated this year. On behalf of myself and Justyna, who makes everything to make this newsletter looks the best - Have a nice read!

Grzegorz Osipowicz

It happened in the past

In year 2001, the first experimental archaeology camp organized by the members of the Society for Experimental Prehistoric Archaeology took place in the small village Sąsieczno, near Toruń.

During this two weeks project an attempt was made to reconstruct a shallow pit-house from the Stone Age. Only flint, bone and antler tools were used to this work. Only techniques employed were those available in the Stone Age.

Inside a reconstructed shallow pit-house during Winter

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My first experiences in Polish experimental archaeology

Below you can find a short text written by Brandon Emerson, student of the University College Dublin in Ireland, who was a volunteer during excavations at Mesolithic sites Paliwodzizna 29 and Nowogród 26 in Poland, led by dr hab. Grzegorz Osipowicz from 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; website: www.searchingformesolithic.umk.pl).

During the excavations Brandon had an opportunity to be a part of the many experimental projects. One of them was aimed at wearing for a long time tooth pendants. It was connected to traceological analyses of the tooth artefacts from the Subneolithic sites in Šventoji (Lithuania). The second one focused on experimental processing of the different types of materials with obsidian tools. This project was a part of the studies aimed in the recognizing of a functional structure of the Early Neolithic (LBPC) settlement in site Tominy 6 (southern Poland). Brandon had also a possibility to join us in some smaller experimental projects like birch tar production or making the lumps from the seals fat. Below You can find his relation from these works. We hope You will enjoy it :-)

Editors

Brandon Emerson

Before I arrived in Poland, I had never had the chance to be a part of a truly structured and beneficial experiment. The first, and largest, experiment that I was able to take part in was creating jewelry from boars' teeth. On the first day, for many hours, we worked with stone drills to carve hole into the teeth, from which we would hang them on various materials.

This whole process, at first, seemed to be rather time consuming for the final outcome of some teeth with holes in them. It soon became clear though that so much could be learned from a seemingly simple experiment.

It had been explained to me before we started that were would be making these pieces of jewelry so that we could test their wear traces to those on archaeological ones. Having not been part of a comprehensive and well-rounded experimental program though, I had glossed over many of the takeaways that the members of the team who were part of the experimental program easily and seamlessly noted.

Brandon with Lukas (on the upper left; volunteer from Lithuania), Rober and Kamil (polish students) during drilling in teeth using a hand drill.

Brandon and Lukas during drilling in teeth using a bow drill.

I was eventually enlightened to the fact that we could not only figure out how the teeth were drilled, from one side or both, but also if certain drills had been used for drilling on teeth versus other various materials.

The second time that we did a lot of different experimental work was when we completely devoted an afternoon to doing various experiments. The day before we did all the experiments, we prepared a kiln within which we would produce birch tar. Although this was not the first time that people had produced birch tar, it was the first time that I had done it and the tar from this experiment would be used later in different experiments.

Brandon and Mario (volunteer from Spain) during building a birtch tar kiln.

Firing a birch tar kiln is a long, but relatively uninvolved process, so during the mean time Dr. Osipowicz and I turned to creating seal fat lamps from pieces of wood that we burned out.

Brandon creates his own wooden lamp *:-)*

Once we had nice bowls, we cut up chunks of seal fat, soaked the twine wicks in the oil, and lit them. His worked well, and mine did not, but we were able to come up with several hypothesizes as to why mine did not work and they

Brandon, Mario and dr hab. Grzegorz Osipowicz during discussion after opening the birch tar kiln.

will be tested in later experiments. The following day, after allowing the kiln to cool all night, we cracked it open to see a pot of birch tar.

Later that day we did a quick experiment that truly showed me how helpful they can be. We needed to create use wear traces on pieces of obsidian, by simply cutting, to provide references for some archaeological sample Dr Osipowicz was analyzing but did not recognize due to his rare encounters with obsidian. After 15-20 minutes of cutting on the fifth different material, he was able to say definitively that was what created the marks, thus easily advancing our understanding of these tools.

Brandon and Amanda (volunteer from UK) during experimental usage of the obsidian tools. Here, while cleaning pig scapulas from meat.

It is now clear how beneficial experimental archaeology is, and that the UMK experimental program is exemplary in its practice.

Brandon Emerson

Do I smell fire?
Experiments with searching for illegible hearths

According to the existing concepts related to the behavior of archaic communities, the central object around which the life of such groups was concentrated was very often the hearth (Binford 1983, 153). The acceptance of such an assumption allowed some researchers to develop methods for analyzing the internal organization of prehistoric camps (e.g. Stapert 1989, 5–6). An important element of the studies aimed at better understanding of the dependencies between the distribution of the overheated artefacts and location of the prehistoric hearths are experimental studies (e.g. Sergant, Crombé, Perdaen 2006, 1000-1006).

Experiments of this type carried out in Toruń had three basic goals (compare Osipowicz 2017) :

1) analysis of changes occurring in the location of artefacts inside the flint scatters under the influence of trampling, in a sandy environment;

2) analysis of influence of the short-time fire on the level of overheating of the flint products located within and around the hearth;

3) analysis of usefulness of the Kernel density estimations (KDE) in the process of the identification of the prehistoric flint scatters, but mostly hearths without the stone constructions (presently illegible as the objects in archaeological context).

The experiments planned required the creation of a flint scatter, with a characteristic similar to typical, Mesolithic feature of this type. For this purpose, 8 spieces of the Baltic –erratic flint, with technical parameters and size corresponding to the artefacts found in the early Holocene sites were knapped (Osipowicz 2010, 248). During the process, conical core, single platform blade core and multiplatform flake core techniques were used. The knapping was carried out on a specially prepared area of approximately 9 m^2, which was covered with a 10-cm layer of sand. After knapping, the flint proccesing place that was created covered the area of about 0.54 m^2, with the individual products scattered on the surface of 1.5 m^2.

Next, the location and range of the planned hearth was marked out. It was placed in such a way as to include a part of the created flint scatter and the area containing individual products. Also, a line of flints was created, running from the inside of the hearth to its outside. This line was created to analyze the relationship between the location of the flints and the degree of their overheating.

A view on the created experimental flint scatter directly after knapping (the knapper position is marked with a yellow string).

The next step was firing the hearth for one hour with the use of pine wood. After that, the area of hearth was "cleaned up" by removing the rest of unburned wood and larger charcoals. At this moment, the first analysis of the distribution of flints with various degree of overheating was made, which resulted a conclusion that overheated specimens were located only within the area of direct, long-term impact of fire, and their range closely overlaps with the area of overheated and discolored sand.

The line of flints applied to examine the relationship between the degree of their overheating and location within the hearth.

Experimental firing of the hearth on the flint scatter.

The next stage of the experiment was the analysis of changes occurring in the location of flints in the knapping place and the hearth under the influence of trampling. To make this kind of registration possible, thirty randomly selected specimens were given the numbers. A total of 7 people participated in the ongoing trampling during one month. It can be said that it was a fairly intense process, because the described area was on the way between the buildings of the existing farm, so in the experiment actively participated not only members of the archaeological expedition, but also the farmers performing their daily duties.

After the completion of this stage, the excavations were carried out on the entire area, in a manner identical to those performing at the archaeological sites, also accurate documentation was made.

Documenting the flint scatter and hearth after firing.

As a result, it was found that the displacements in the horizontal plane that occurred for individual products were very small, although some of them were not identified due to the abrasion of numbers. The image of a flint processing place visualized using the KDE proved to be essentially the same before and after the start of trampling. More interesting changes were observed in the vertical plane - the flints originally deposited on one level at the end of the experiment were spread throughout the 10-centimeter thickness of the layer. Similar observations was made after the analysis of the displacements that have occurred among products with varying degrees of overheating. The picture of their distribution has generally not changed, which allows to conclude that, despite the small legibility of the remnants of the hearth, its identification on the basis of their decomposition is still possible. The KDE method has also confirmed its exceptional usefulness in this aspect.

View of the remnants of the hearth after a month of trampling.

The only problem one can pay attention to is the short duration of the described experiments, from the perspective of millennia of the influence of post-depositional processes at archaeological sites. The full results of the studies can be found in the monograph written by G. Osipowicz, titled. Mesolithic Communities of the Chełmno- -Dobrzyń Lakeland: An Attempt at a Model Multifaceted Analysis of Function and Spatial Organisation of Selected Camps (Osipowicz 2017).

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G.O.

„Seal scrapers" from Šventoji. What was their function?

During the excavations carried out at the complex of Subneolitic sites in Šventoji, Lithuania (sites 1, 4, 6 and 23), 27 extremely interesting bone products has been discovered. Due to the characteristic of the use-wear and technological traces, which are macroscopically readable on their surface they were defined as "scrapers". Those dated ca. 3000 cal BC tools were made of harp seal tibia, about 70-80 % of them from right side bones.

The examples of the „seal scrapers" found in Šventoji.

The artefacts bear very characteristic and unique use-wear traces. Because of the location of sites in Šventoji and the archaeozoological structure of the collected bones it has been suggested that these tools are related to maritime economy and, above all, with the processing of raw materials obtained from seals. The fact of passing the body of a dead seal by the Seaside Regional Park in Lithuania to the Vilnius University for scientific purposes gave a unique opportunity to conduct experiments verifying these hypotheses. Of course, the seal could not be transported to Poland, but surfing on the wave of the multifaceted cooperation and excellent relations that connect us with the employees of Departments of Archaeology of the Lithuanian Institite of History and Vilnius University, we traveled to Lithuania.

The first stage of experiments was relatively simple. It was necessary to pre-clean the hide of seal from the layer of fat (luckily, colleagues from Lithuania were so loved that they took care of the skinning of animal before we arrived themselves, thanks again Giedre and Gytis! ☺). We carried out the removal of fat using flint blades and we have found this process relatively easy.

Dr Giedrė Piličiauskienė, dr Gytis Piličiauskas (on the upper right), dr hab. Grzegorz Osipowicz and PhD student from Vilnus University Lukas Gaižauskas during the cleaning of the seal's hide.

The seal`s hide cleaned from the fat with a flint blade.

Then the time has come to carry out the right experiments, and thus precise cleaning of the hide using scrapers made of seal tibia. We performed this activity both directly on the hide (without any additives) and with the addition of ocher and powdered charcoal. Furthermore, we have planned and implemented an experimental program including for example scraping the fishes (removing the scales) and many other activities, to interpret the function of the "seal scrapers" from Šventoji correctly.

Experimental scraping the fishes (removing the scales), using tools made of bone.

The next step was the traceological analysis of tools used during the experiments, the results of which we compared with the data obtained during use-wear analysis carried out on Šventoji scrapers. As a result, the most similar functional damage to those readable on the artefacts was observed on

Experimental processing of the seal hide with addition of ochre using tools made of seal tibia.

the tools used to scrape the seal's hide with an addition of ocher. These observations were confirmed by chemical studies that led to the identification of increased iron content both on Šventoji tools and on experimental ones.

The results of these studies were discussed in more detail in the poster presentation shown at the UISPP Conference – *„Seal scrapers" from Sventoji – possible function and technology of production* (author Grzegorz Osipowicz, Gytis Piličiauskas and Giedrė Piličiauskienė);

https://www.researchgate.net/profile/Grzegorz_Osipowicz.

The full results of these studies will be published in the form of an article in the near future.

G.O.

Example of reconstructed Neolithic flint knife made by members of Society for Experimental Prehistoric Archaeology.

„Fish and ~~chips~~ flints" - our beginnings in the processing of fish hides

As can be seen from the archaeozoological structure of bones collections from many prehistoric sites, fish were an important part of a diet of the early Holocene and even earlier communities. Tools related to the processing of this raw material were discovered, among others, at the Neanderthal levels of site Payre in France (Hardy, Moncel, 2011) and at the Mesolithic site in Starr Carr (Robson at all, 2018).

Recently, at the Institute of Archeology NCU, an experimental program has been started aimed at extension of our knowledge about the characteristic of the usage traces typical for tools used to treat this raw material and possible techniques of its processing. The main thing that we should be aware of before attempting to this type of experiment is the fact that fish were probably catched not only for consumption. The materials obtained from them could have been used for many activities, for example, clothing sewing, container production or as decorative elements. Such practices have been observed in the communities of native Americans, Innuits (Greenland, North America, Siberia), Saami (Scandinavia), Nanais (Siberia) or Ain peoples (Sakhalin, Japanese and Kuril Islands).

The aim of the first stage of our experiments was a try to tan the hides of several species of fish to the condition allowing use for the purposes mentioned above. We used 28 large perch, 5 trout and 1 salmon for the planned works. The fish were treated with flint blades and flakes. The works were divided into following stages: scaling, cutting the skin and meat, skinning and fleshing by scraping. Each of these activities took no more than 1.5 hours (in most cases about 40 min, using 1 tool). The total surface of the "cleaned" hides was 4194 cm^2 (including: 1904 cm^2 of the perch ones, 1150 cm^2 of trout, and 1140 cm^2 of salmon).

Skinning the fresh trout.

Removing leftovers of meat form the fish hide with flint tool.

The next step was to tan the hides. For this purpose, the hides of perch were placed in a container with egg yolks mixed with oil (in the ratio of 1 to 1). For the tanning of trout and salmon hides, a mixture of egg yolks and cold water (also in a 1 to 1 ratio) was used. These methods are known from the literature (Richards, 2004). After 48h, the hides were removed, thoroughly washed, and then dried and smoked with the beech wood.

Fish hides soaking in a mixture of egg yolks and water.

This process was to protect them against the growth of molds and bacteria and to increase their resistance to water (Richards, 2004). This method could have been used by prehistoric communities, as was described, among others, by Lewis Binford (1967). The fish hides tanned this way seems to be a strong and durable material.

Salmon leather after smoking.

Summing up the conducted works, it can be stated that fish processing with the flint tools is relatively simple and effective. From the slight differences observed during the work with individual species, it can be mentioned that skinning of the perch required undercutting, while the trout skins were removed from the carcasses without the use of any tools.

The next stage of the planned works are (next to subsequent experiments of this type with other fish species) use-wear analyses of the experimental tools and processing of the obtained leathers into "utility" products in order to check their suitability in everyday life.

We will inform you about the progress of this works.

Trout leathers after tanning process are quite transparent .

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Justyna Kuriga

Conferences, conferences...

At the turn of May and June, in France, took place two international archaeological symposiums ,where one could hear many interesting speaches and see fantastic presentations also on experimental archeology.

The first one was the meeting of members of the traceological association AWRANA (Association of Archaeological Wear and Residue Analysts), which took place in Nice, from May 29 to June 1.

The conference program was divided into several thematic sessions, that focused on methodological assumptions in which archaeological experiments often play an inseparable role. The most interesting and often innovative presentations included those focusing on residues and works related to the experiments with ranged weapons.

In turn, from 4 to 9 June 2018 in Paris took place the 18th UISPP (Union Internationale des Sciences Préhistoriques et Protohistoriques) World Congress. Also here, one could hear about many interesting experimental studies which were presented, among others, within two traceological sessions: *New Technologies and Analytical Approaches in Traceology* and *Searching Traces* and Finding *People: The Role of Traceology for Reconstructing Human Behaviour.*

We have also presented the results of our studies (including experimental ones) at both conferences.

At the first of the described meetings, two posters were shown. The first one was focused on the results of experimental and traceological research connected with the issue of possible function of the Mesolithic bâtons percés: *Function of the Mesolithic bâtons percés: problem solved?* (author Grzegorz Osipowicz and Mariusz Bosiak), in turn, the second one concerned the influence of the peat environment on usage traces observed on artefacts made of antler: *The same or different? Experimenting with the influence of peat environment on use-wear traces on antler tools* (author Justyna Orłowska). This poster took the third place in the competition for the best student presentation. We are really proud of it! :-)

At the conference in Paris, dr hab. G. Osipowicz gave a speech, titled.: *Mesolithic wood tar production place? Possible dwelling and a complex of the stone structures from Paliwodzizna 29 site, Golub-Dobrzyń commune (central Poland)* whose subject was, among others a method of wood tar production, without the use of ceramics in Mesolithic. Moreover, there were presented two posters. The first one described the results of experimental studies and multi-faceted traceological analyses, which have become the basis for the interpretation of the possible function and technology of the production of unique bone "scrapers" from Sventoji: *„Seal scrapers" from Sventoji – possible function and technology of production* (author Grzegorz Osipowicz, Gytis Piličiauskas and Giedrė Piličiauskienė). The second one concerned prehistoric grinding techniques: *Finish that bone tool – a closer look at different prehistoric grinding techniques* (author Justyna Orłowska).

Dr hab. G. Osipowicz and MA J. Orłowska during AWRANA Conference. Photo by Shoh Yamada

Both conferences were the perfect place to exchange knowledge and establish new contacts. We cannot wait for the next meetings of this type :)

J. O.