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Complex Analysis of Bone, Antler and Tusk Tools from the Late Neolithic Site of Aszód-Papi földek

Doctoral Dissertation
SUMMARY

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At the beginning of the study of the worked osseous assemblage (animal bone, teeth and antler) excavated at the Late Neolithic site of Aszód-Papi földek we almost had no information at all about this rich group of finds. Large number of worked bone, antler and tusk tools are discovered at the same time although on every Neolithic site in Hungary, but did not occupy their rightful place in the research until now. They received minor role in the studies, which means ultimately information loss for the archaeological interpretation. At the beginning of my research I set as a fundamental aim to modify this routine demonstrating with the study of the Aszód material that important information can be obtained with the study of worked osseous materials combining several different research methods. As the result of such complex investigation economic, social and household data of the sites can be enriched or made more sophisticated.

I tried to combine several different methods during my study in order to maximize the gained data out of the material. The dissertation is a multi-methodological work in this point of view. The three main pillars are the typology, the technology and use-wear analysis.

1. The first pronounced point was the formal grouping, creating a typology. Although the archaeological literature has a long tradition in form-based grouping of the different archaeological assemblages, these are almost exclusively based on morphology. This is although a useful, but not enough detailed method, and like that it does not fulfil the modern requirements of scientific research process. Another big disadvantage is, that the appellation of the groups also includes functional interpretation, which should be avoided until the functional identification is proved by use-wear analysis. Because of this reason I tried to develop a typological system, which appellations does not carry any functional interpretation. During the study of bone and tusk tools I found the typology developed by Jörg Schibler (1980, 1981) very useful, because it is based on species and skeletal element preference, but does not contain any functional interpretation. The second advantageous attribute of his system is its expansibility, so it could be easily modified taking in account the specific features of the Aszód (and generally non-Swiss) material. Creating the formal division a system came into being, which can later be well suited for study of contemporaneous sites, the necessary changes and extensions can be easily integrated.

2. The group of quartered small ruminant metapodial awls were separated during study from the assemblage as an individual typological sub-category of the regularly bi-partitioned awls. The legitimate separation is proved by the identification of the same sub-type on other sites as well. Reconstruction of the technological chain of manufacture is not yet complete, but the identification of the composite technique

used during manufacture is already successfully identified (CHOYKE-TÓTH 2013). In addition we observed, that the raw material of this special awl type is not the generally used sheep/goat bones accompanied by some roe deer, but they were especially choosing roe deer metatarsal bones.

3. For the study of the antler assemblage a good typological system, which could be adapted to our site was not available, so here it was me, who developed a system at the moment without regular use-wear analysis results. The system at the moment is more general, because of the lack of use-wear data is far from being holistic, but the types can be subdivided later. The classification follows the anatomical order of the red deer, handling separately tools produced from the upper part, middle part of the beam and the lower part of the beam with the rose. During this process new morphological types were divided among the antler tools.

4. The second pillar of the study was the technological examination of the finds. The main objective was the as full as possible reconstruction of the raw material processing (*chaîne opératoire*). The understanding and recognition of the basic techniques was essential, so I carried out extensive experiments partly for myself to understand the technical gestures, and on the other hand, that the stigmas left on the object themselves can be compared to those of the experiments, making a certain identification possible. The operational sequence is multi-staged, for all archaeological objects complex. I followed this division during study and presentation, beginning with the raw material acquisition, though the primary modification (*débitage*), to the various techniques of shaping, renewing and reparation until the dawn of the object's lifetime, the disposal. Technological study in such detail on such large assemblages is quite rare, that was the reason, why it was necessary to lay down the foundations, particularly in relation to the operational sequence and its stages. The explanation of the *débitage* techniques is also a detailed descriptions of the basic techniques at the same time, but I followed the same principles by the description of the shaping and reparation techniques as well.

5. The greatest achievement of the technological study is the identification of the fundamental *débitage*, shaping and reparation techniques, some of them could be reconstructed exactly (ef. bipartition of bones by groove and splinter technique and not prepared splitting, sectioning antler by freehand and positioned chopping and sawing). During the study of techniques I was able to prove, that composite techniques were also applied at Aszód at this stage of transformation (eg. bone: groove and splinter technique + fracturation; antler: choppig/sawing + fracturation). I proved also

the widespread use of various fracturation techniques in the Neolithic, especially during the blank production.

6. Other important result of the technological studies is, that using the method of incomplete refitting (*remontage „par défaut”*) I was able to reconstruct successfully the operational sequence of bone and antler processing. This reconstruction showed finally that special attention was paid to the red deer antler processing at the site, during which they worked towards the most appropriate cutting for producing suitable blanks for especially heavy duty tools (T-axes and adzes). As you can see in the analysis above, antler processing has played a very important role at Aszód–Papi földek, despite the fact, that despite all our efforts the presence of the “antler workshop” could not be proved. Compared to other coeval sites, proportion of worked antler is outstanding, which marks the importance of this area, as well as the red deer population living here. Definitely an important factor therein is that Aszód lies in the forest covered mid-mountain region of Hungary, which counts to be rich in game in current conditions, too. It was certainly similar in the Neolithic period, too, so antler of roe deer and red deer were common and relatively easily available raw materials. In contrast to this at sites on the Great Hungarian Plain this raw material was less processed. This fact suggested very early the explanation, that antler as raw material, its exploitation and processing played prominent role in the economic life of this settlement, and the site could have played an intermediary role in the flow of goods.

7. The third pillar of the dissertation was the study of use-wear. A similar study has been unprecedented on Hungarian bone tool material, so it was necessary partly to clarify the terminology, partly creating the steps of standardized study. Therefore I started this chapter with the description of the history and development of the method which was followed by a methodological description. Initiation of the investigations made clear, that taphonomical effects significantly affect the satisfactory examination of finds. This aspect was never emphasised in the research until now, because as most common lakeshore sites with excellent find conditions were studied with use-wear analysis.

The use-wear analysis was concluded with less, than previously excepted results, but compared to the fact that until now we had absolutely no available data, the first attempt of applying this method can be considered as successful. It served as an important lesson, that the preservation of finds and taphonomical effects play a crucial role in the successfulness of the study. This will be an important factor in the future by choosing samples and finds for further investigation. However, the studies independently from the preservation were accomplished successfully in the entire macroscopic range. With few exceptions it was possible to decide whether the stigmas

and traces observed on the finds are result of human transformation and utilization. Use patterns observable macroscopically could be fully identified and understood. As most important result of the microscopic observation period we may say, that even by finds with poor surface preservation we may achieve results with this method, although due to the time and energy investment prudent sample selection is needed. We were able to separate during microscopic investigations if the traces on the best preserved tools had been caused by use in contact of hard or soft material. In some cases even the direction of the motion could be identified with the help of use striations.

8. The studies have also some puzzling results, for which currently we have no explanation yet. Such are the entirely lacking use-wear of the "bones with scraped surfaces" (TÓTH 2013), for which the only explanation is that the scraping identified as stigmas of manufacture do not truly belong to the manufacturing, but must be traces of use. This interpretation has not been successful so far, because we did not find any evidences of the use of bone chips created with the scraping. All this is completely contrary to the data gained from ethnographic parallels, because in all periods the function of the tool is connected to the hide processing, hair removal or defleshing.

9. Punches could be first time surely identified. These tools played important role in the production of flaked stones, in particular they were essential in blade production. The separation of the punches and the tentatively identified pressure flakers is an important step since the cut off antler tines are discovered in hundreds at every site. They were unidentified of treated as wastes until now, but at least some of them could now be identified as tools, which were used and connected to their original function. Unfortunately the study of the flaked stone tools did not cover the identification of punch technique or pressure techniques on the site that is why it would be interesting to examine the stone tools from this point of view in the future. In addition, extended experimentation is needed to check the accurate utilisation of the punches and pressure flakers.

10. Taphonomy was originally not included in the proposed test methods, but as the study progressed it became clear that the elaborate mapping of taphonomic effects found on the finds is necessary. This later proved to be the critical examination of the finds, also explained a number of observations, especially concerning the finds today's surface conditions and injuries.

11. The analysis of the composition of the zoological and worked assemblage at Aszód showed clear differences in raw material preference. Generally speaking, in the Neolithic period of Hungary worked osseous materials are clearly dominated by the Class I. tools, which are highly planned, characterised by strict raw material preference (species and skeletal element too) and multi-staged manufacture process. In the Aszód material both for the worked bone and the worked antler assemblage is true, that the well planned, multi-stage manufactured tools are the base of the collection, which were often renewed or given a different function, if they were not able to fulfil their original tusk anymore. Representing the different transitional stages between Class I-II. and Class II. (less well planned to *ad hoc* tools) are rare, much less represented in the assemblage and are based exclusively on bone raw material.

Assumptions and preliminary data suggest, that similar technical standards and opportunities existed at each Late Neolithic site of the Carpathian Basin. However the basic rules of raw material choice and tool preparation show a diverse picture. In connection of the bonetools they held themselves less strict to the rules. The raw material and skeletal element choice refers to their basic economic system, the prevalence of cattle and importance of hunting and the traditional importance of small ruminants in tool production. Common exceptions, however give the expression that "rules" are not really dealt with in the particular case of tools made from bone. Technical style of the different types show basically a uniform picture, but tools made in a different style occur often.

In contrast, handling antler, techniques used during the preparation of tools, utilisation and rejuvenation are highly standardised. The primary chopping of the raw material (*débitage*) is performed in every case with the same technique (chopping/sawing+fracturing). Anatomical places of cutting are uniform, resulting both similar preforms in shape and size and characteristic waste, too. Like this, the end products, the antler tools are similar, too, in technical style, size and shape. This can be related to the importance of antler tool production. In the case of Aszód–Papi földek, a specialised settlement could have played an important role in the production and trade of antler tools on big scale. In contribution to this, if Aszód was an important trade centre, we may assume that the population living here must have been more colourful, which can lead to several different bone manufacturing traditions living next to each other at the same time, similar to the diversity observed in ceramic style.

12. In conclusion, the objectives of the dissertation have been achieved. Complex research consisting of typological, technological and use-wear analysis was performed at the selected site, Aszód–Papi földek. As result, our knowledge about daily life, economic system, technical level of the community could be enriched as well as their relations. We demonstrated, that even incomplete data we get in possession of can

lead to conclusions, which might help to answer overall archaeological questions. We may state, that in relation to the investigated finds, the red deer antler processing played a major role in the settlement's economic life, even if limited to one particular archaeological feature, the presence of an antler workshop could not be justified based on technological criteria. Analysis of the different worked osseous materials showed different manufacturing traditions which result matches with the conclusions drawn from the pottery style analysis.

It has been shown, that the combination of different methods, developed and used here is fruitful, further research is desirable on different find materials. The information obtained from a variety of methods can be used to observe differences in technical style and between individual sites, which on long term can lead us closer to understand better the Late Neolithic way of life and way of thinking.

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