Śląskie Sprawozdania Archeologiczne
Tom 56, s. 31-40 Wrocław 2014

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RESEARCH PERSPECTIVES OF THE TRACEOLOGY OF METAL ARTIFACTS

Abstract:

Although traceology is used mainly in the research of the artifacts made from stone, bone and antler, this method is increasingly used also in the study of metals, particularly copper and copper alloys. Due to the physical and chemical properties of metal, the characteristics of these tests differ slightly from the aforementioned artifacts made of stone and organic materials. Research conducted over the past several years have focused mainly on determining whether the artifact was used in the past, and if so, in what way exactly – to which end the experimental method is being used. Use-wear traces visible on the surface of metal artifacts are usually connected with various types of artifacts and less with contexts in which they have occurred. The so-called biographical approach that has been developing for several years in humanities, including archeology, is a promising alternative to more traditional solutions, because it requires the scholar to look at the subject of research in a holistic manner.

Key words:

traceology, theory, method, metals, copper, copper alloys

INTRODUCTION

Similarly as in the case of the research conducted on the artifacts made from stone and organic materials, the purpose of traceological analysis of metals is the attempt to answer the question of whether a given objects was used, and if so, in what way. It includes both macroscopic analysis conducted without special equipment and microscopic analysis with the use of small and large magnification. The starting point for the formulation of conclusions regarding the technology of production and ways an object was used are the results of experimental research.

FUNCTION

As one of the first archeologists Kristian Kristiansen (1999, 1999a, 2002) has extensively dealt with the topic of morphological traits of bronze swords, as well as visible repair and damage marks and he concluded that they clearly point to the fact that bronze swords were once used during armed skirmishes. Barry

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Molloy (2008, 2010, 2011) took a step further and while focusing on Aegan bronze swords, he undertook an attempt at reconstruction of the fighting style and its evolution on the basis of changes in morphological properties, results of traceological analysis and results of experiments. The theme of the function of bronze swords and daggers has been often touched upon in the last few years (Coloquhoun 2011; Dolfini 2011; Gener 2011; Matthews 2011; Mödlinger 2011; Horn 2013), as well as halberds (O'Flaherty 2007; Brandherm 2011; Horn 2011; O' Flaherty, Gilchrist, Cowie 2011; Dolfini 2011; Sych 2013), spearheads and arrowheads (Schauer 1979; Anderson 2011; Sych 2011) or shields (Molloy 2009; Anderson 2011; Uckelmann 2011). Thanks to these research we know today which objects were used, we have learned what actions caused the formation of particular use-wear and we also realized that the question of the use of objects is much more complicated that it would seem at first. Despite the immense amount of work that has already been done, to state that a given artifact was used is just the first step in traceological analysis.

CONTEXT

Although the traceological method allows to reconstruct, in a quite probable way, the chaîne opératoire and to state whether the object in question was used without considering the archeological context, it is difficult to make conclusions regarding its relation to a man. The context is exactly what allows us to say if the analyzed object could be a votive gift, a tribute to the gods, a mark of social status or simply a hidden resource that would be later retrieved and melted. Even though the answer is rarely unambiguous, traceological analysis allows to rule out certain interpretations. Sue Bridgford's research (1997, 2000) may serve as an example – she decided to find a relation between different types of Irish swords of late Bronze Age, their contexts, quality and visible use-wear. Similar approach was chosen by Adrei Dolfini (2011) who analyzed the Chalcolithic Apennine metallurgy and Christian Horn (2011) who dealt with halberds.

BIOGRAPHY

To construct a full biography of an artifact is the final purpose of traceological and technological analysis. The greatest contribution to beginnings of biographical research in archeology was an article written by Michael Schiffer's (1972, 157-160), who coined the term of "systemic context." This idea refers to a sum of actions (from providing the proper material, through production, usage, preserving, repairing until abandonment because of which the artifact became a part of archeological context) that made up the "life" of an object. Each of the processes of the systemic context distinguished by Schiffer is made from smaller stages and these, in turn, from individual actions. Especially important for the systemic context of an archeological artifact was its transport and storage that could take place on each main stage and sub-stage of the systemic context, as well as between

them. No less important was the usage of an object – the more intensive it was, the higher the probability of damage or destruction. If it occurred, decision regarding its melting or abandonment was made (Bridgford 1977, 96).

An author of a similar theory is an American anthropologist, Igor Kopytoff (1986), whose brilliant article "The Social Life of Things: Commodities in Cultural Perspective" has become the cause for theorists of social sciences to begin studies concerning corporeality. Unlike the above mentioned, this article illustrates the advancement of objects' personification. Kopytoff assumes that each thing and object was born, lived and then died. Since an object, during its "life-span," could be repaired, remade or subjected to exchange or trade, its function could change many times. All these stages together build the cultural biography of things (Kopytoff 1986, 66-68). Kopytoff noticed that objects may also have many different biographies. He names among others economic, technological and social biographies. However, the most important fact is that not every biography may carry the information about culture: "What would make a biography cultural is not what it deals with, but how and from what perspective" (Kopytoff 1986, 68).

In reference to a specific group of artifacts – the monuments – Richard Bradley used the term of "life after death" or "afterlife," i.e. new reinterpretations of an object made by different people that had contact with it. The leading example being the Stonehenge, which during the Neolithic period and the Bronze Age was reinterpreted several times, which was confirmed by the results of archeological research (Bradley 1991); whereas the life of an object is a period of original interpretation made by the society that created it.

Cornelius Holtorf (2002) presents a yet different approach and uses the term "life history." He does not agree with the idea that the moment an object is abandoned, thus its incorporation into the archeological context, is the moment of its death. That is why he differentiates between short and long life history of an object. The former relates the time from the moment an object is created to its abandonment and becoming a part of the context, therefore it involves a period in which the object functioned among its natural relations. While the latter concerns the time from its birth until the present day and involves all of the objects' relations both in the past and the present. What connects the short and long life history is the corporeal essence of things that stays the same despite different functions prescribed by men.

Why is the biographical aspect is so important? Objects do not live in a vacuum but in a specific space that is constituted by two basic dimensions. The first delineates the character of relations built, kept and destroyed by the use of objects. Therefore, objects may be either means used for human communication or tools allowing for shaping of reality, accessing it or influencing others. Nothing prevents an object from being at the same time the one and the other. The second dimension that establishes the social space of an object is the way it is seen by an individual, i.e. whether it is accessible for the sensory cognition. The life space of an object determines its status in the human-object relation (Krajewski 2013; Pomian 2006).

Another important attributes of things are their durability and "lifestyle" (Krajewski 2013). Durability is represented by how long an object lives, which is influenced not only by its material but also the manner in which it is used by a man, while there does not necessary exist a direct relation between them: "A durable object is the one that is with us since always but also the one whose roles, functions and ways in which we use it do not change." Durability, similarly to post depositional factors, has a considerable significance for the survival of the artifacts until the moment of excluding them from the archeological context in the moment of getting them out of the ground by an archeologist. The lifestyle of an object, which is inseparably connected to the durability attribute, means the "way it enters the life of a community, settles in its area and moves in its space." Since in the past a part of the artifacts was subject to exchange, their lifestyle could change many times. On this affordances had considerable influence, i.e. the ways in which a man may influence the objects in his environment and in which they may influence him. According to James Gibson when a person looks at an object they do not pay attention to its properties, but to its affordances. In the context of artifacts' biography it is especially important because the function of the artifact could significantly depend on the perception of an individual or of a community – a bronze dagger could be perceived as a weapon, a tool, a symbol of power or simply a scrap of metal that should be melted (Gibson 1979). Tim Ingold (2007: 1) is of similar mind when he states "The properties of materials (…) are not fixed attributes of matter but are processual and relational."

While speaking of artifacts' biographies we may not forget about now widely promoted ground of social sciences, namely the idea of "agency" of things. Alfred Gell (1998) formed a theory according to which things are created in order to influence the thoughts and actions of people, and their agency is visible in the fact that the object works, i.e. causes a specific effect. It refers not only to utilitarian objects, but also to those that are commonly perceived as without purpose. Gell distinguishes two kinds of agents – people are primary agents, while objects, as an extension and emanation of human will, are secondary ones. The author does not prescribe intention to objects but he focuses on the relations of agency – without a hammer, a man will not knock a nail, similarly as the nail will not be knocked into a board without a man. In this context the nail and the hammer are not only tools of the agent but also a part of his "divided personality" - the agent is not present only in the place where his body is present, but also where all the nails he knocked are, as an extension of him (Gell 1998). Bruno Latour (2005), an author of actor-network theory, goes much further. He rejects the dualistic division of the world to oppositional ontological dimensions of nature and culture, and proposes perceiving them in a relational way. According to the actor-network theory everything can be an actor, as long as it works. People and things are seen through a prism of opposite attributes but mutual relations. In practice, it signifies the blurring of the border between the human-agent and the thing-tool (Domańska 2012; Olsen 2013, 212-216).

RESEARCH PERSPECTIVES

While looking at any artifact the archeologist asks himself a number of various questions regarding its biography. Visible use-wear may be helpful in determining the intention of the creator and function of the artifact (fig. 1 and 2). Object produced with care, that have barely visible production use-wear, especially those ornamented, could be made with the intention of long usage or for a specific

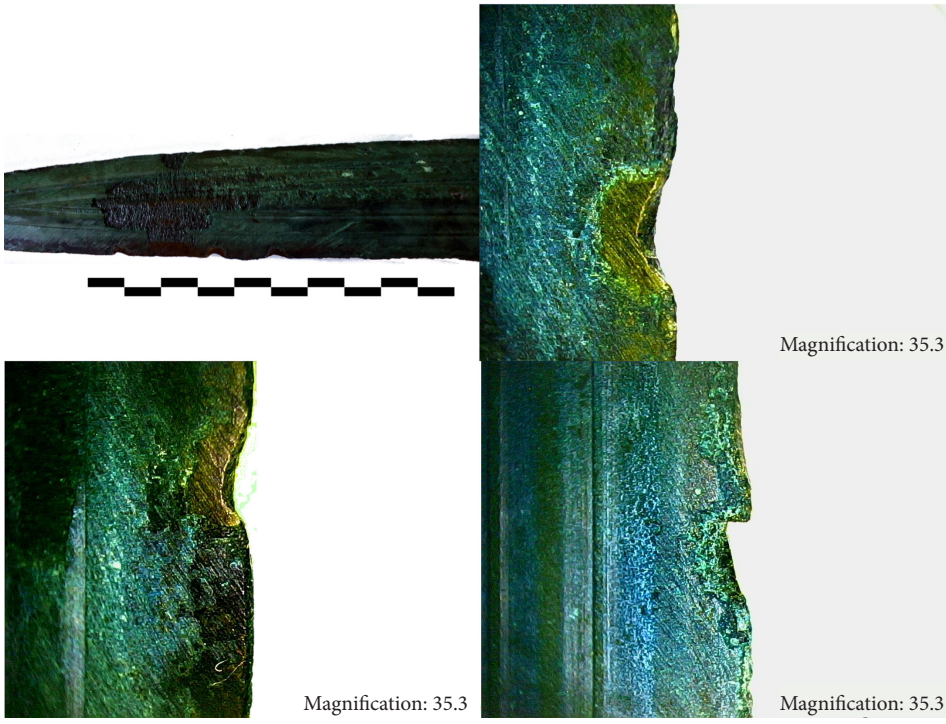

Fig. 1. A speciemen of use-wear traces visible on one of the swords from Gamów, Racibórz district (phot. author).

occasion, such as funeral or a votive gift. If a carefully made object carries damage traces, it may signify that its function was not only symbolic but also utilitarian. In turn, objects that have a vast amount of both production and damage marks could have been produced on ad hoc basis and on a large scale. However, the question of quality should not be omitted. While comparing the quality standards of contemporary and prehistoric metallurgists, we may notice that they differ immensely. In practice, it means that a defective object did not have to be perceived as such in the past (Gener 2011). If the structural defects (according to contemporary standards) co-exist with use-wear marks, a thesis may be formulated, that despite that, the given object performed a utilitarian function and the defect did not influence its usage. Hoard consisting of 133 bronze arrowheads from Wrocław-Widawa

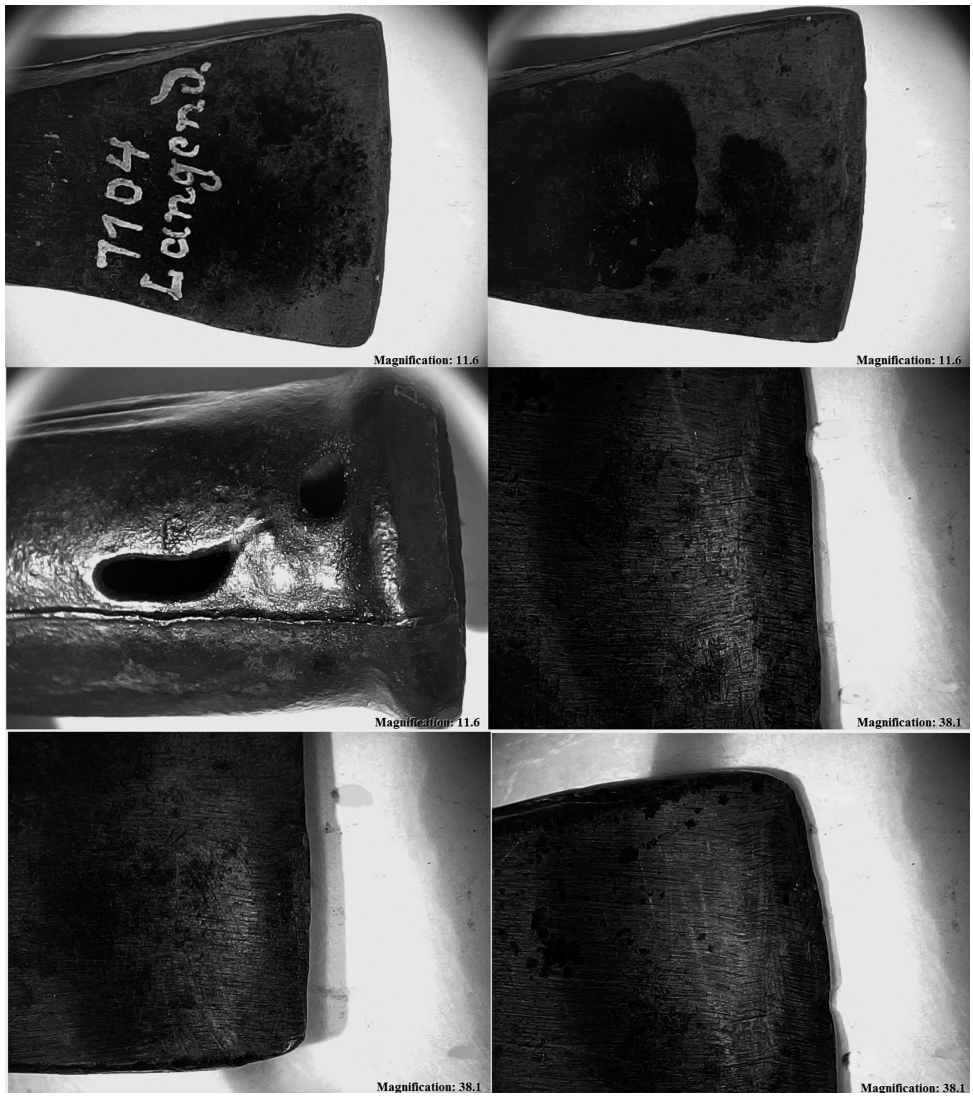

Fig. 2. A speciemen of use-wear traces visible on one of the axes hoard from Czarków, Gliwice district(phot. author).

17 is a good example. Artifacts are asymmetric, casting seams and other casting defects are visible – on first sight, arrowheads look like half-finished or unsuccessful products. Traceological analysis revealed use-wear on the majority of them, which allowed to conclude that artifacts were meant to look this way, since they were small, easy to loose and produced in high numbers (Sych 2011).

On the other hand the marks concerning repair and altering made in order to restore the damaged object's original function or, if it was not possible, prescribe them a new one, were especially important. According to the biographical approach,

this, so called, treatment was supposed to prolong the life of an object (Binford 1979; Bamforth 1986). The presence or the lack of repair marks may deliver valid information regarding the function of an object as well as the intensity of its usage. Treatment marks are often identified with production marks – damage could be removed by among others: forging, sharpening and grinding. Repair marks may either overlap with production marks, but not necessarily. A special way of repair is the altering, or re-making of an object, which may signify a great sense of attachment of his owner, or something entirely different, like poor economic situation or lack of access to the resource or experts possessing proper knowledge. The corrosion of metals might be a considerable obstacle for traceological analysis. Despite the fact that the context of an artifact may be clear, the visible marks may be not, which immensely impedes traceological analysis. Although objects made from copper alloys are less susceptible to corrosion than iron ones, the access to essential data is often hindered – not only because of corrosion, but also because of the patina which affects artifacts made from copper alloys and influences them not only aesthetically but also has protective properties. In such cases restoration work, X-ray studies and expert traceological research deliver detailed data concerning the way a man gave shape to the matter, thus information regarding the biography of the studied objects.

Traceological analysis, and inseparably from it, the biographical research of metal artifacts carries many limits stemming from the nature of the material, which shape may be forever influenced. While in the case of stone or bone artifact, the archeologist is capable of stating (although in a limited way) how the object looked and what changes it underwent, he never knows whether he is dealing with the first form of an object when its made from metal. Biographical research of metal archeological artifacts thus concerns only the history of a thing and its relation with a man in its final shape.

ACKNOWLEDGEMENTS

I would like to thank all my colleagues from Museum of Silesia in Katowice, Museum of Upper Silesia in Bytom, Museum in Gliwice, Museum of Dąbrowa Basin in Będzin, Archeological Museum in Wrocław, Museum of Opolian Silesia, Museum in Wodzisław Śląski and Museum in Racibórz who allowed me for the analyses of artifacts and were most helpful to me during my research.

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