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Quaternary International

journal homepage: www.elsevier.com/locate/quaint

Optic observations on osseous uniserial harpoon heads from the Polish Lowland as an element of discussion about their chronological affiliation

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ARTICLE INFO

Article history:

Received 31 January 2017

Received in revised form

9 August 2017

Accepted 12 November 2017

Available online xxx

Keywords:

Late Glacial

Early Holocene

Harpoon head

Bone

Antler

Traceological analysis

Stray finds

ABSTRACT

The Late Glacial and early Holocene points and harpoons made of bone and antler are one of the most common finds from these periods in the southern Baltic zone. They are a manifestation of the well-developed hunter-gatherer economy of that time. The presented work deals with a group of characteristic, uniserial harpoon heads which are mostly well known from Late Palaeolithic and Mesolithic contexts. Their common characteristics are: one row of distinct, massive barbs, distinguished tang, and wide, flat base. Originally, the finds of this type discovered on the Polish Lowland, constituted a fairly large collection, with over twenty specimens of this type mentioned in the literature. Unfortunately, the majority of them were discovered at the beginning of twentieth century and most of them were lost during World War II. This paper present the first detailed technological analysis of the seven remaining specimens. The artefacts included represent a valuable source of information on issues related to processing bone material by the Late Glacial and early Holocene communities in the Polish Lowland. Results of the study can also become an important argument in discussion about chronological affiliation of these kind of forms discovered on Polish Lowland.

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1. Introduction

The occurrence of bone and antler artefacts at Late Glacial and early Holocene sites in Europe is an interesting indicator of the complex and rich manufacturing output of communities of that time. In the case of the Polish Lowland, the majority of recovered artefacts are classified as the so-called stray finds, i.e., accidentally discovered items, most often found outside their archaeological context. Given the environmental conditions of the Polish Lowland, the Late Glacial and Early Holocene artefacts of bone or antler are only likely to preserve if they were deposited in lacustrine deposits, rivers, wetlands or swamps existing at the time. For that reason, the vast majority of artefacts are found by accident during various construction works. In Poland, a particularly high concentration of excavated products made of organic materials (mainly in the form of various harpoon heads and points) was discovered at the turn of the 20th century and was related to

industrial-scale extraction of peat, ceramic chalk, and land development works.

Harpoon heads occupy an important place among the rich variety of Late Glacial and early Holocene osseous hunting weapons discovered on the European Lowland (Kozłowski and Kozłowski, 1977). This kind of artefact should be regarded as a special development of hunting weaponry which began during the Upper Palaeolithic in Western Europe (i.e. Julien, 1982). Thus far, however, researchers' attention has been mostly focused on chronological, typological and cultural aspects (Clark, 1936; Kozłowski, 1977; Kozłowski and Kozłowski, 1977; Czesła, 2002; Zagorska, 2006; Galiński, 2013).

The aim of this article is to present results of optic observations made on a group of uniserial harpoon heads, which due to their morphology are classified as Clarks' type 12A (Clark, 1936; Kozłowski, 1977; Galiński, 2013). As it seems, technological similarities and differences that have been observed can be an important argument in discussion about their chronology and territorial distribution in a context of differences registered in the raw materials used as well as the obtained radiocarbon dates.

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1.1. Context and chrono-cultural attribution

The uniserial harpoon heads, to which this paper is dedicated, are considered as characteristic elements of the equipment of Late Glacial and early Holocene hunters, and their occurrence in these period is limited mainly to the area of Sweden and countries in the south and east Baltic Sea region (e.g. [Kozłowski, 1977](#); [Cziesła, 2002](#); [Zagorska, 2006](#)). As it was noticed, in morphological terms the presented group corresponds to the so-called type 12 A, which were first classified and presented by J. G. D. [Clark \(1936\)](#). His typology was later complemented and corrected by other researchers based on additional finds from Polish Lowland ([Kozłowski, 1977](#); [Galiński, 2013](#)). The artefacts discussed here are characterised by, *inter alia*, equal width of the shaft throughout the length of the artefact, a single row of well-defined barbs, and a flat widened base.

Generally, this type of harpoon head is commonly dated to the end of the Pleistocene and the very beginning of the Holocene ([Kozłowski, 1977, 1989](#)). Their Final Palaeolithic origin is highlighted by the raw material features (mostly reindeers' antler or bone) and morphological characteristics, as well as decorations that commonly appear on their surfaces (zig-zags, herring bone pattern, rows of short oblique notches, and short horizontal notches arranged in bars). They are mostly derived from communities of the tanged point technocomplex (i.a., [Cziesła, 2004](#); [Galiński, 2013](#)), which is dated to Younger Dryas/beginning of Preboreal, c. 12 800–11 000 cal BP (i.a. [Cziesła, 2004](#); [Galiński, 2013](#)). However, Final Palaeolithic artefacts of this type from the area of Western Pomerania and Masovia can also be related to backed blade groups ([Płonka, 2012, 110](#)).

Uniserial harpoon-heads with large barbs known from the early Holocene sites were produced mostly from bones of forest large mammals (mainly elk long bones – [Kozłowski, 1977, 1989](#)). They were discovered on sites representing post-Swiderian, Kunda and Neman traditions like: Kunda-Lämmasmagi in Estonia, Lake Lubana and Zviejnieki II in Latvia ([Indreko, 1948](#); [Kozłowski, 1989](#); [Zagorska and Zagorskis, 1985](#); [Vankina, 1999](#)), Balsupiai and Rudninkai in Lithuania ([Rimantienė, 1971](#)). Some similarities are also noticeable on the Mesolithic finds from Russia, e.g., Ivanovskoje 7 ([Skakun et al., 2011](#)) and Neolithic materials like those from site Könnu in Estonia ([Luiik, 2013](#)) or interpreted as Protoneolithic finds from Lake Mausz in Poland ([Galiński, 2013](#)).

Therefore, the exact chronological and cultural position of the harpoon heads that are of interest to us here raises still many doubts and requires complex studies, involving their morphology, raw material and territorial distribution (i.a., [Kozłowski, 1977](#); [Baales, 2002](#); [Cziesła, 2002](#); [Cziesła and Masojć, 2007](#)). What is important here, even the radiocarbon dating of these kind of finds, may not provide the answer to questions concerning their cultural affiliation (see study made by [Riede and Edinborough, 2012](#)).

2. Methods

The terminology used for characterising observed patterns by means of microscopic observations was based mainly on established criteria already defined in the traceological and archaeological literature concerning osseous artefacts (e.g. [D'Errico et al., 1984](#); [Olsen, 1984](#); [Christidou, 2008](#)). The taphonomical observations were made according to relevant literature (e.g. [Olsen and Shipman, 1988](#); [Fisher, 1995](#); [Madgwick, 2014](#)) concerning artefacts made of bone and antler. The observed traces were analyzed among others, with regard to their location, morphology, and distribution on the artefacts' surface. In addition, technological interpretation were based on the comparison with first-hand experimental data related among others to the different kinds of scraping and whittling techniques ([Orłowska, 2016](#)). Morphological

description of the harpoon heads was based on a system developed by the Committee of Nomenclature of Prehistoric Bone Industry ([Averbough, 1995](#)). Metrical information of harpoon-heads, included length, width, thickness and max/min barb dimensions were recorded in accordance with [Julien \(1982\)](#). Microscopic observations were conducted using a Nikon SMZ-2T microscope system with magnification range of 10× to 80×. The micrographs of the technological traces were made with a Nikon 5000 camera attached to the microscope.

3. Materials

In the literature, we find information on over twenty uniserially barbed harpoon heads of the discussed type found in the Polish Lowland. Unfortunately, most of them were lost during World War II. Less than ten artefacts have survived to this day, of which seven were available for this study. These include: fragments of a harpoon head from the regions of Bydgoszcz, Biskupin in Żnin district, and Ostrów Wielkopolski in Ostróda district, as well as complete and almost complete harpoon heads from Rękawczyn in Sierpc district, Staświny in Giżycko district, Sołdan in Giżycko district, and Orzysz in Pisz district ([Figs. 1 and 2](#)). Detailed data on the specimens can be found in [Table 1](#).

All discussed artefacts come from water-logged environments or watercourses. Their deposition places might be related to the way they were utilized. It is assumed that tools of this type were used as elements of a harpoon, i.e., a weapon whose blade is separated from the shaft when embedded in the flesh of a prey (i.a., [Weniger, 2000](#)). Implements of this type were used for catching both aquatic- and land-game.

For most of the presented artefacts, the proper archaeological analysis has not been performed. Due to the lack of possibility to do it for the purpose of this work, the presented osteological identification is based on the data published in the literature.

4. Results

The state of preservation of artefacts has a significant impact on the potential to carry out objective technological analyses. In the case of the analyzed specimens, difficulties were caused both by the fragmentary state of preservation of most artefacts and by severe post-depositional changes, i. a. erosion caused by plant roots ([Figs. 2.5, 7 and 4a](#)), weathering and exfoliating of the outer surface of the bone ([Fig. 2.7](#)), lack of maintenance or improper maintenance. For that very reason, the observations covered in the study are oftentimes fragmentary and should be considered with caution while forming conclusions about the production process of the bone harpoon heads. They may, however, serve as a source for further comparative analysis of this type of material and, in many cases, complement our understanding of bone processing by the Late Glacial and early Holocene communities.

Of the seven bone artefacts, the state of preservation of four allowed a detailed technological analysis to be performed (compare [Table 2](#)). These include a fragment of a harpoon head from Biskupin and harpoon heads from Rękawczyn, Staświny and Orzysz. For other artefacts, only single traces related to the production process have been observed.

The basic techniques used for shaping the artefacts were based on carving and scraping of bone surfaces, starting from tips ([Fig. 3a](#)), through shafts ([Figs. 3b and 4d](#)), to barbs ([Figs. 3j and 4i](#)) and bases ([Fig. 3o,s](#)). Moreover, on the tips of the harpoon heads traces of rounding and micro fractures ([Fig. 3i](#)) or even traces of step and hinge terminating fractures ([Fig. 4m](#)) can be observed, which may indicate to some extent that the tools have been used. The

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