Quaternary International 403 (2016) 57–67

Contents lists available at ScienceDirect

Quaternary International

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

Rod debitage by extraction: An overview of different cases identified for the Upper Palaeolithic and the Mesolithic in Europe

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ARTICLE INFO

Article history:
Available online 29 September 2015

Keywords:
Bone technology
Debitage by extraction
Rod production
Upper Palaeolithic
Mesolithic

ABSTRACT

One of the objectives of the CNRS European Research Group GDRE PREHISTOS is to look for cases of "debitage by extraction" on the European continent from the Paleolithic to the First Iron Age. We will thus be able to fill the gaps in our knowledge by first describing each case in technical and economic terms and by identifying new variants of this method. The rod production by extraction is a major invention in the working of osseous materials and it is conceptually similar to the laminar debitage procedure in stone working in that it allows blanks of a similar shape, artificial and standardized, to be produced. The "baguette", whose shape is close to that of blades, is the best known of these types of blanks. This capacity to produce series of blanks with a sometimes exactly similar morphology and then finished objects led to the standardized mass productions that characterize the evolution of some categories of objects, such as projectile points. This debitage by extraction appears globally during the first half of the Upper Paleolithic (being present in the Early Gravettian of Western Europe). The aim of this paper is to give an overview of different cases identified in the last years for the Upper Paleolithic to the Mesolithic, especially in Europe.

1. Introduction

Debitage by extraction appears commonly during the first half of the Upper Paleolithic (being present in the Early Gravettian of Western Europe). It is a major invention in the working of osseous materials, as it allows production of series of blanks with a similar, artificial and standardized shape. The "baguette" (or "rod") is the best known of these blanks debitage by extraction. This paper is focused on its production by extraction, and aims to present an overview of it during the Upper Paleolithic to the Mesolithic with a few case studies from European sites.

2. Analytical hierarchy approach to the procedures related to the processing of osseous material

Tool manufacturing involves distinct know-how and the implementation of a series of actions and technical operations organised in sequences. In this paper, we will highlight the technical transformation sequence and its main action, which is debitage (Fig. 1). The notion of debitage used here refers to an intentional action, the aim of which is to create a blank from a piece of raw material (bone, deer antler, ivory, teeth). In the processing of osseous material, debitage consists of the fracturing of the initial raw material block by sectioning (or segmentation), extraction, bipartitioning or breaking (Averbouh, 2000) (Fig. 2). The notion of shaping refers to an intentional action the aim of which is to shape a blank independent of the selected transformation method. Shaping encompasses all the operations related to the modification of the blank shape: general shaping (shaping of the volume, modification of the outline, the faces, etc.) and shaping of the attributes that determine the morphology (perforations, barbs, lateral or central longitudinal grooves etc.).

In practice, human groups used various techniques and procedures (or actions) to manufacture their tool kit. In this context, the notion of technique merely defines the basic action carried out on the raw material ("*action élémentaire sur la matière*", Leroi-Gourhan, 1943). Consequently, using the grooving technique strictly means creating a groove. The processing of osseous

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http://dx.doi.org/10.1016/j.quaint.2015.08.072
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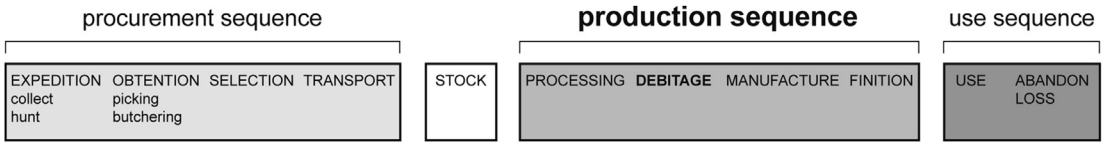

Fig. 1. Exploitation sequence of osseous materials (Averbouh, 2000).

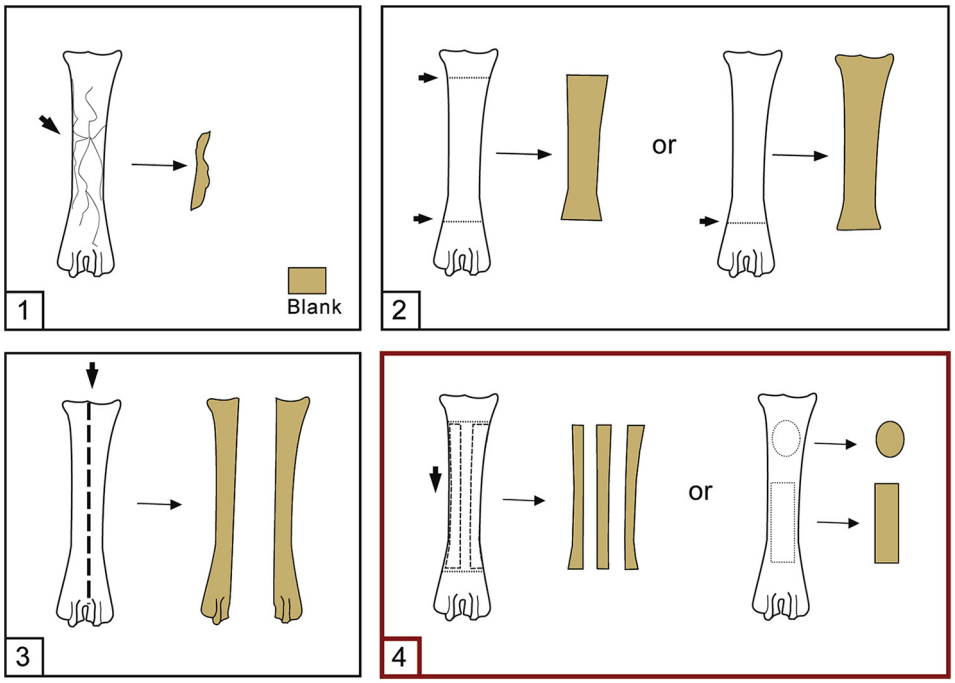

Fig. 2. Transformation of osseous materials: the 4 methods of debitage 1) by fracturation; 2) by sectioning; 3) by bipartitioning; 4) by extraction (Averbouh, 2000, CAD D. Molez).

material includes breaking techniques (such as breaking by bending, breaking by direct percussion, breaking by indirect percussion, removal by diffuse percussion, removal by direct percussion) and shaping techniques (such as abrading, cutting, polishing, scraping, grooving, sawing) (Averbouh, 2000). Each technique leaves specific marks on the worked osseous material. The identification (and detailed description) of technical stigmata therefore makes it possible to determine the techniques used for artifact production.

The identification of an "action" (or "procedure"; for translation, see Averbouh, 2010a,b) is the next level of the analysis. This term denotes a combination of several technical actions for realizing a specific operation. Such procedure is thus defined by the techniques used, their organization, and the intended result (Pigeot, 1991a,b; Inizan et al. 1995). Various actions such as carving, engraving, drilling, extraction action, delineating action, sectioning action, are related to major (debitage, shaping, finishing) and minor operations (block preparation, blank delimitation, blank removal) of the technical transformation sequence (Averbouh, 2000). The best known procedure related to the rod production is the famous "Groove and splinter technique" (GST) named by Clark and Thompson (1953). To avoid confusion with other rod extraction actions, we prefer to name it the "double grooving procedure" (DGP). It is not a technique but an action (or procedure), and prevents mistranslation in other extraction actions that also include grooving technique (for instance the grooving/splitting action: Goutas, 2003).

3. Rod production by extraction and its characterization

At the conceptual level, the characterization of the method of debitage by extraction is that the blank product has an artificial shape and that the artisans aimed at selectively exploiting the internal structure of the block (more generally, an antler or a bone). The obtained product is more generally a rod, in the form of a narrow or large strip depending on its type. The blank-rod is not systematically related to the debitage by extraction, as it can also be obtained with another method of debitage, such as debitage by bipartition, for instance. However, the obtained blank can also be a disk or a slab type ("*plaquette*") (Fig. 2). At the practical level (procedure actions and techniques), the debitage by extraction can be realized in many different ways.

The rod production by extraction, on which this paper is focused, is the last major invention in osseous material working, whose appearance is currently attributed to the first half of the Early Upper Paleolithic (Early Gravettian of Western Europe). Conceptually similar to the laminar debitage procedure in stone working (Averbouh, 2000; Goutas, 2004, 2009), it leads to the production of series of standardized blanks and thus, of finished objects. Therefore, the rod production by extraction is directly involved in standardized mass productions, characterizing the development of some categories of objects, such as projectile points, especially during the Magdalenian (Averbouh, 2014b) (Fig. 3). Characterizing rod production by extraction technically and economically defines it by the identification and characterization of