Written in Bones

Studies on technological and social contexts of past faunal skeletal remains

edited by
Justyna Baron
Bernadeta Kufel-Diakowska

Uniwersytet Wrocławski
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Editors
Justyna Baron and Bernadeta Kufel-Diakowska

Reviewers
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Layout
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Cover
Justyna Baron

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Corneliu Beldiman, Diana-Maria Sztancs, Viorica Rusu-Bolindeț, Irina Adriana Achim

Skeletal technologies, metal-working and wheat harvesting: ancient bone and antler anvils for manufacturing saw-toothed iron sickles discovered in Romania

The paper presents the results of the analysis of recent data regarding a unique assemblage of 40 artefacts retrieved during the 2001-2008 archaeological excavations in the "Basilica extra muros" and "Basilica with Crypt ("Florescu") sectors of the ancient city of Istria (Constanța County, Romania). Almost all of the objects represent completed and used pieces (tools) and there is some raw material (cattle metapodials). There is also an exceptional piece made out of a red deer's antler (on a segment of a beam). These artefacts were used as anvils for manufacturing toothed iron sickles and have been dated back to the IInd-IIIrd centuries A.D. In the past six decades, these kind of artefacts have generated numerous controversial debates relating to their origins, diffusion and especially to their functional role. Artefacts of this kind have been discovered in two large geographical areas including the Western Basin of the Mediterranean Sea and the Western and North-western regions around the Black Sea and have been dated to between the Vth century B.C. and the XVIIIth century A.D. The research methodology included the analysis of various parameters such as: data relative to the context of their discovery, type (established conventionally after a number of technically modified and used anatomic faces: 1-2-3-4), state of conservation, raw material, dimensions, manufacture, traces of use, reshaping, and traces of reuse. The traces of manufacture and use were analysed using an optical microscope. Apart from the relative rarity of these pieces we can mention the fact that this study of antique bone and antler anvils from Romania benefits from an extended and unitary research approach and brings an important documentary contribution to the presence of these controversial artefacts in some Central-Eastern regions of Europe. The artefacts in question illustrate complex interconnections between different traditions over an extended period of time. This study of bone and antler anvils from Romania provides an important contribution to the knowledge of the technology and economy in ancient Europe.

Keywords: agriculture, ancient anvil, ancient sickle, bone and antler industry, iron technology, Istria.

Introduction

On this occasion we are going to discuss a category of artefacts which are generally called "anvils". For other European regions and for Northern Africa, the archaeological literature mentions many such artefacts dated from the Hellenistic and the Roman period (Vth century B.C.-Vth century A.D.). These artefacts were discovered in Greek cities from the Black Sea Basin (Olbia, Neapolis, Thanagoria

etc.), as well as in Scythian-Greek and Getic settlements (Arnăut 2007:298-300; Peters 1986:162-3, pl. III/1-11; Semenov 1970:186-8, fig. 100-102 – with bibliography). Others are largely dated between the VIIth-XVIIIth centuries and were retrieved in settlements from the Western Mediterranean Basin (France, Spain, Portugal, some countries from Northern Africa) (Briois *et al.* 1997; Esteban Nadal, Carbonell Roure 2004; Moreno-Garcia *et al.* 2005a, 2005b, 2007; Poplin 2007a, 2007b; Rodet-Belarbi *et al.* 2007 – with bibliography).

In the context of new research interest manifested for the topic of bone anvils at the 5th and 7th WBRG some archaeologists and archeozoologists started to pay more attention to this kind of artefacts (e.g. Poplin 2007a, 2007b; Moreno-Garcia *et al.* 2005a). Consequently we can observe increasing of the list of publications dealing with this topic for Central and Western Europe, including Southern Italy (a piece dated in IInd century BC-Ist century AD) and Austria (Gál 2010; Gömöri, Szulovszky 2010; José Gonçalves *et al.* 2008).

Very recently were published some pieces coming from Hungarian Medieval sites (Xth – XIIIth centuries AD). So, at Felgyő – "*Kettőshalmi dűlő*" are mentioned bone anvils made of cattle femur coming from Avar context (Kőrősi 2010:112, fig. 7-8). From the rural site of Cegléd – "*Fertály-földek II*", there are mentioned 32 bone anvils made of horse and cattle long bones. Other artefacts were discovered in a assemblage of a blacksmith Vicus in Budapest, in an oven at the site of Hajdúnánás – "*Fürjhalom-dűlő*" (Gál *et al*. 2010:117) and in the manorial settlement of Baj – "*Öreg-Kovács-hegy*" (anvil made of a cattle radius) (Bartosiewicz 2010:338, Fig. 16; Gál *et al.* 2010:117). They are also mentioned in the medieval village of Kolon, dated from Árpád period. Bone anvils made of cattle and horse long bones (radius, tibia, metapodials, humerus) were discovered in a pit where had been thrown the debris from a smithy (Kvassay, Vörös 2010:127).

Actually, we may distinguish the area of diffusion of artefacts (considered "puzzling" for decades) around the Mediterranean Basin having its origins, probably, in East Mediterranean and Northern Black Sea regions. The presence of bone anvils in Early Medieval Central Europe is a problem to solve.

Over the years, early mentioned artefacts discovered in the Northern part of the Black Sea were wrongly considered to be polishing tools used for finishing textiles, hides, stone or wood. This is the case of first such pieces published by S.A. Semenov (1970:186-8, fig. 100-102). Due probably to the lack of recent international data, some authors still sustain such a functional interpretation decades after the assertions of "Father of Traseology" (Peters 1986:162-3; Arnăut 2007:302 – with bibliography).

There is a special case where the rows of triangular hollows made during usage of anvils were interpreted as "an unknown type of Getic writing" (the case of the artefacts from Chitila: Boroneanț 2005).

Quite recently, "the riddle was solved": the functional role of those artefacts benefited from the observations of technological behaviour in the Iberian ethnography. In this way, and also by using experimental studies, the "manufacturing chain" of anvils and the way of using them has been established (Esteban Nadal, Carbonell Roure 2004:640-4; Aguirre *et al.* 2004; Moreno-Garcia *et al.* 2005b:623-4; Rodet-Belarbi *et al.* 2007:160).

Context. Objectives

On the bank of lake Sinoe in the area of Istria village, Constanța County lies the Ancient City of Histria, the first Greek colony on the west shores of the Black Sea and oldest city within the boundaries of Romania. The colony was founded in the middle of the 7th century BC (year 657 BC according to historian Eusebius) by colonists from Milet, to trade with the native Getae. The city had an uninterrupted growth for 1300 years, beginning with the Greek period and ending with the Roman-Byzantine period. The ruins of the settlement were first mentioned in 1868 by French archaeologist Ernest Desjardins. Archaeological excavations were started by Vasile Pârvan in 1914, and continued after his death in 1927 by staff of archaeologists led successively by Scarlat and Marcelle Lambrino (1928-1943), Emil Condurachi (1949-1970), Dionisie Pippidi, Petre Alexandrescu, Alexandru Suceveanu (1970-2011) and today Mircea Victor Angelescu. There are several Sectors largely excavated every year with very important archaeological results (Suceveanu, Angelescu 2005).

The artefacts presented in this article were discovered during recent research directed by Alexandru Suceveanu from "Vasile Pârvan" Institute of Archaeology of the Romanian Academy, Bucharest. For the results of recent archaeological research in Histria see: Suceveanu 2010 – with bibliography. There are two sectors of the site from which the bone and antler industry was analysed in last years: the Sector *Basilica Extra Muros*, researches led by Alexandru Suceveanu and Viorica Rusu-Bolindeț from the National History Museum of Transylvania, Cluj-Napoca during 2001-

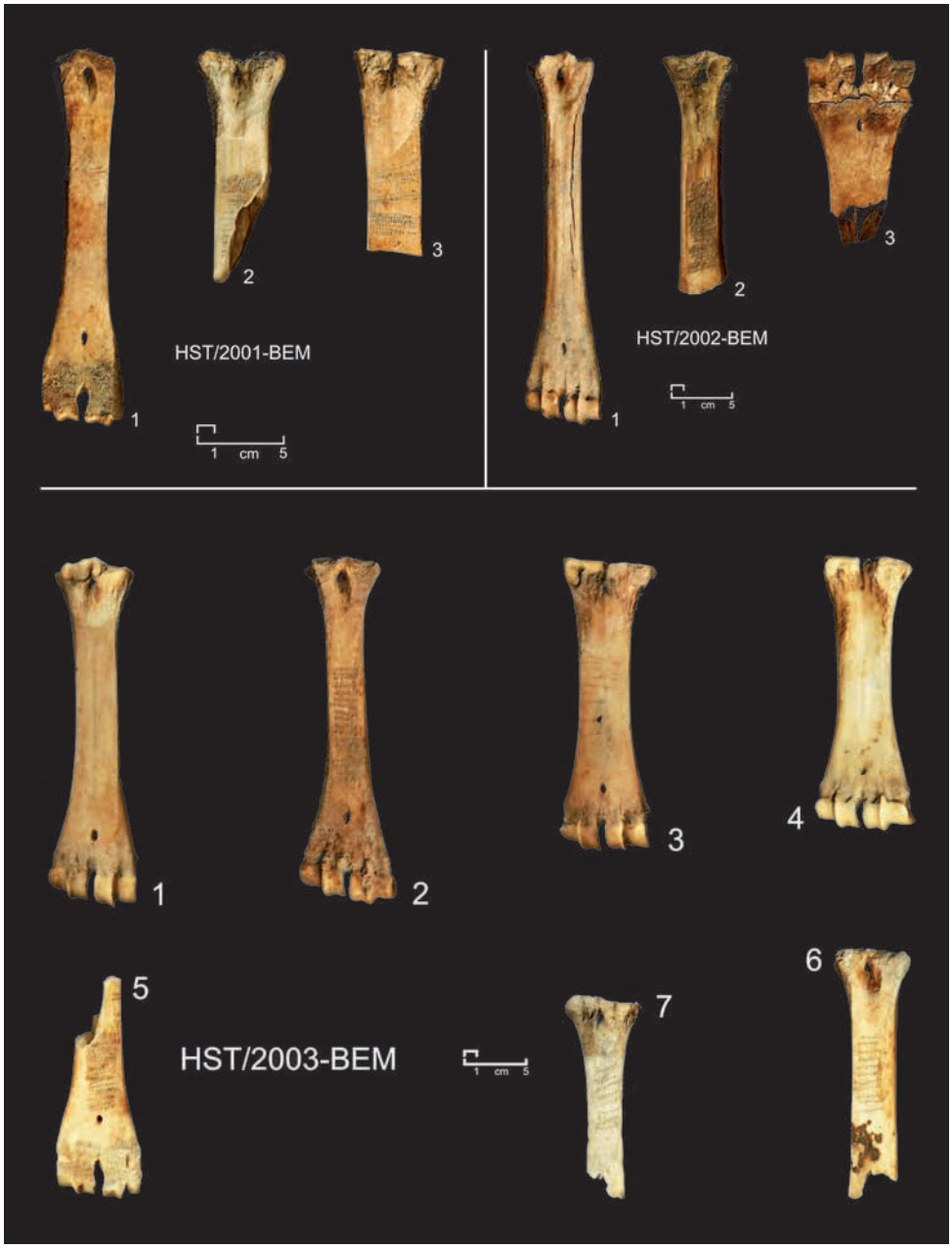

Fig. 1. Istria – Sector Basilica extra muros. Anvils on cattle metapodials and raw material: HST/2001-BEM 1-3; HST/2002-BEM 1-3; HST/2003-BEM 1-6

2006 (Suceveanu *et al.* 2004; Rusu-Bolindeț, Bădescu 2006; Rusu-Bolindeț *et al.* 2009); the Sector *Basilica with Crypt-"Florescu"*, researches led by Irina Adriana Achim during 2002 and 2008 ("Vasile Pârvan" Institute of Archaeology of the Romanian Academy, Bucharest) (Suceveanu *et al.* 2003; Achim *et al.* 2009).

The bone anvils are part of worked osseous assemblages from the two above-mentioned sectors, including 90 pieces and comprising: bone and antler anvils, bone hair pins, bone hafts, bone bands, horn sleeves, a piece of game (astragalus from sheep/goat), blanks, different partially shaped raw materials, waste products etc. (Beldiman *et al.* 2007, 2009; Beldiman, Sztancs 2010a, 2010b).

The bone and antler anvils were of particular interest. This group of artefacts has an important documentary potential because it illustrates, in a unique way, complex economic activities that seem apparently very different, but which were in reality interconnected (farming, agricultural activities, iron craft, bone and antler industry craft, woodcraft etc).

Taking into account all these aspects, the leaders of the archaeological excavations offered them to the main author of this article for a systematic and detailed study. The study began in 2007 when the artefacts discovered in 2004 in the Sector *Basilica Extra Muros* (HST-BEM) were analysed. In 2008 the systematic study of bone and antler industry discovered during 2001-2003 was finished. Other contributions were related to artefacts discovered in 2006 in the Sector *Basilica Extra Muros* and to artefacts retrieved in the Sector *Basilica with Crypt-"Florescu"*

Fig. 2. Istria – Sector Basilica extra muros. Anvils on cattle metapodials and raw material: HST/2004-BEM 1-12; HST/2006-BEM 1-13

(HST-BFL) (Beldiman, Sztancs 2007, 2009a, 2009b, 2010a, 2010b). The pieces from HST-BEM are preserved in the collections of the National Museum History of Transylvania, Cluj-Napoca, while the artefacts from HST-BFL are part of the collection of the "Vasile Pârvan" Institute of Archaeology, Bucharest.

On this occasion, we are going to present a synthesis of data regarding the special category of discoveries made of bone and antler: anvils. These were pointed out for the first time on the western shore of the Black Sea in the ancient fortress city, Histria, and they illustrate in a unique way some technological and economic aspects of those times.

The 38 artefacts from HST-BEM (Figs. 1-2, 4) were discovered abandoned in secondary contexts. They come from structures, pits and from the vicinity of some complexes used for reducing the iron ore, connected to the craft area from Section I (the western extremity, about 15.8 m) belonging to the Early Roman period (probably, 1st-7th decades of the IInd century A.D.) (Rusu-Bolindeț *et al.* 2009, 2010).

The artefacts from HST-BFL (Fig. 3) were discovered in secondary contexts and probably abandoned. They cannot be dated with certainty because of the former interventions related to Grigore Flo-

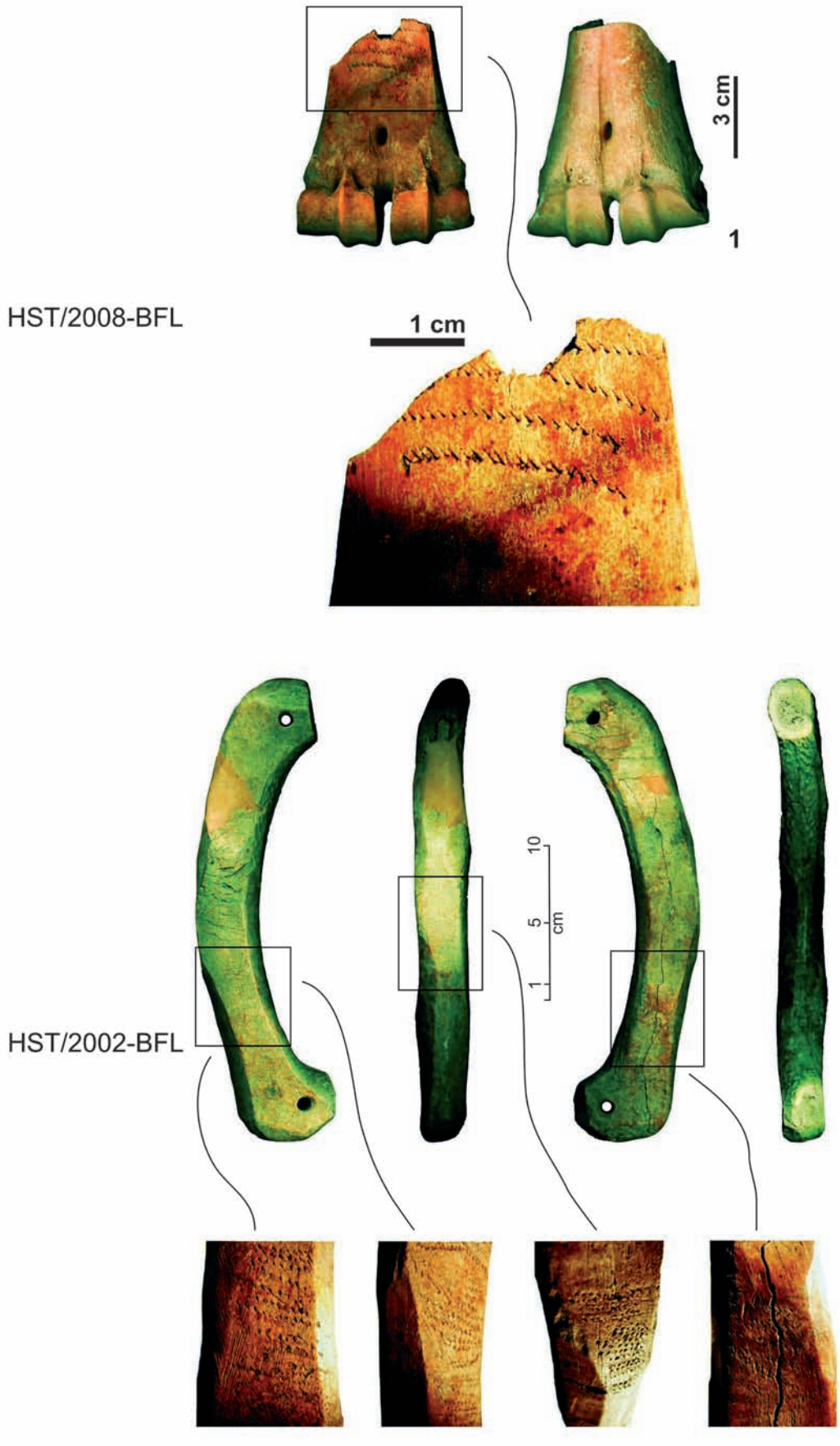

Fig. 3. Istria – Sector Basilica with Crypt ("Florescu").
Anvil on cattle metapodial: HST/2008-BFL 1. Anvil on segment of red deer antler beam: HST/2002-BFL 6

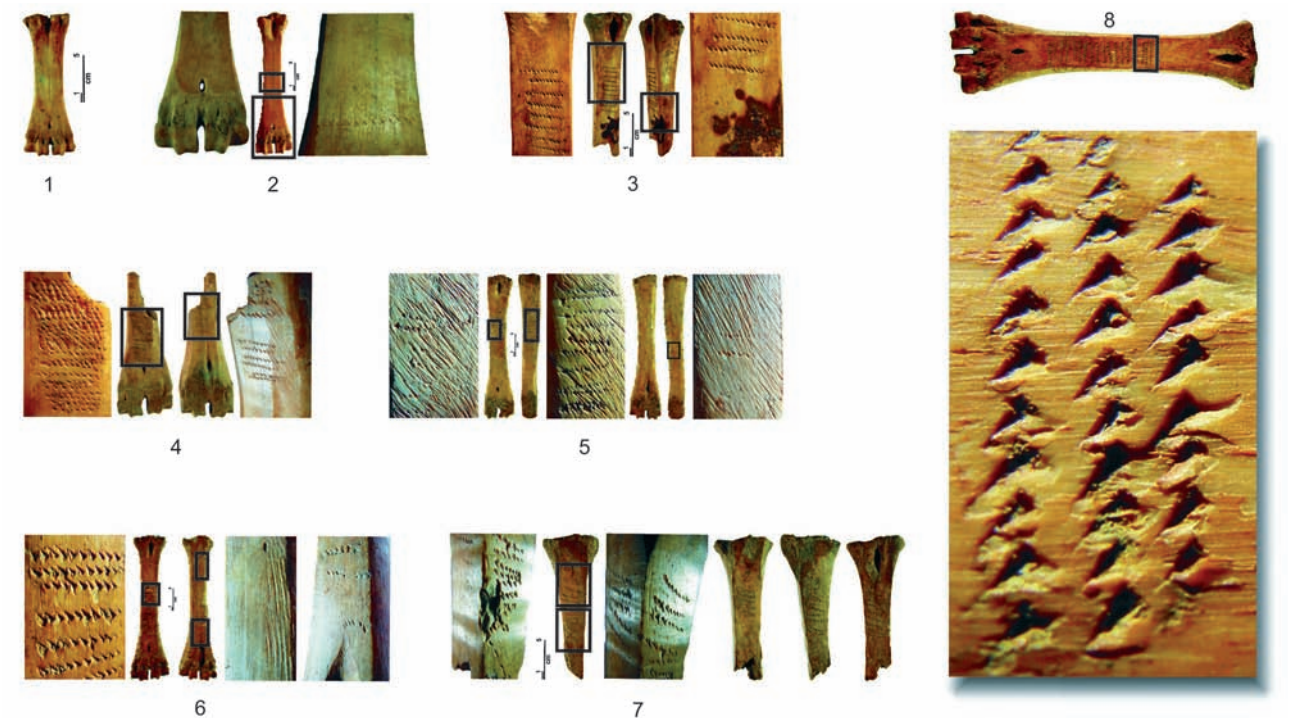

Fig. 4. Istria – Sector Basilica extra muros. Anvils on cattle metapodials – details of specific use-wear: 1 HST/2003-BEM 4 (raw material); 2 HST/2003-BEM 1 (anvil with one smooth surface); 3 HST/2003-BEM 6 (anvil with one smooth surface); 4 HST/2003-BEM 5 (anvil with two smooth surfaces); 5 HST/2001-BEM 1 (anvil with three smooth surfaces); 6 HST/2003-BEM 2 (anvil with two smooth surfaces); 7 HST/2003-BEM 2 (anvil with four smooth surfaces)

rescu's excavations. There are some clues that indicate chronological data during *grosso modo* the IInd century A.D. (Achim *et al.* 2009). From this sector two pieces have been analysed: a piece which was discovered in 2002 and another one found in 2008 (tables 1-2; charts 1-2).

Methodology. Typology

The methodology applied during our study takes into account the registration and the analysis of all essential data regarding: the artefacts' identification using a code (which is made up of the site's code, the discovery year, the sector's code and a serial number – for example: HST/2001-BEM 3); the realisation of the repertoire (which lays out the dataset regarding the code of the piece, discovery context, raw material, conservation status, subtype, description), morphometry (the total length/the preserved length; width/diameter of the edges and of the middle part; the length of active part on each side; maximal/minimal width of active part on each side – dimensions are given in millimetres).

Artefacts that are generically called anvils were set in a special wooden installation, on a workbench and were used in the façonnage/shaping of iron sickles (striking the serrated edges – using the technique of indirect percussion with a triangular section chisel/poinçon). This operation was applied at the initial shaping of the sickles' blades, and also at the sickles' repairs (Fig. 5).

The typological classification adopts conventional criteria which reflect the usage stage at the moment that the artefacts were abandoned. Taking into consideration the number of anvils' shaped anatomical faces/sides (which become active/smoothed parts) we may conventionally distinguish the next subtypes: simple anvils (with one active side), double anvils (with two active sides), triple anvils (with three active sides), quadruple anvils (with four active sides), undetermined subtypes (fragments) and raw material. As we already mentioned, the subtypes reflect the stage of shaping and usage of the artefacts (Beldiman *et al.* 2008:50-61) (Fig. 4).

The typological structure of the collection from Histria consists of: simple anvils (17), double anvils (6), triple anvils (2), quadruple anvils (6), undetermined subtypes (fragments) (2) and raw materials (7) (tables 1-2; charts 1-2).

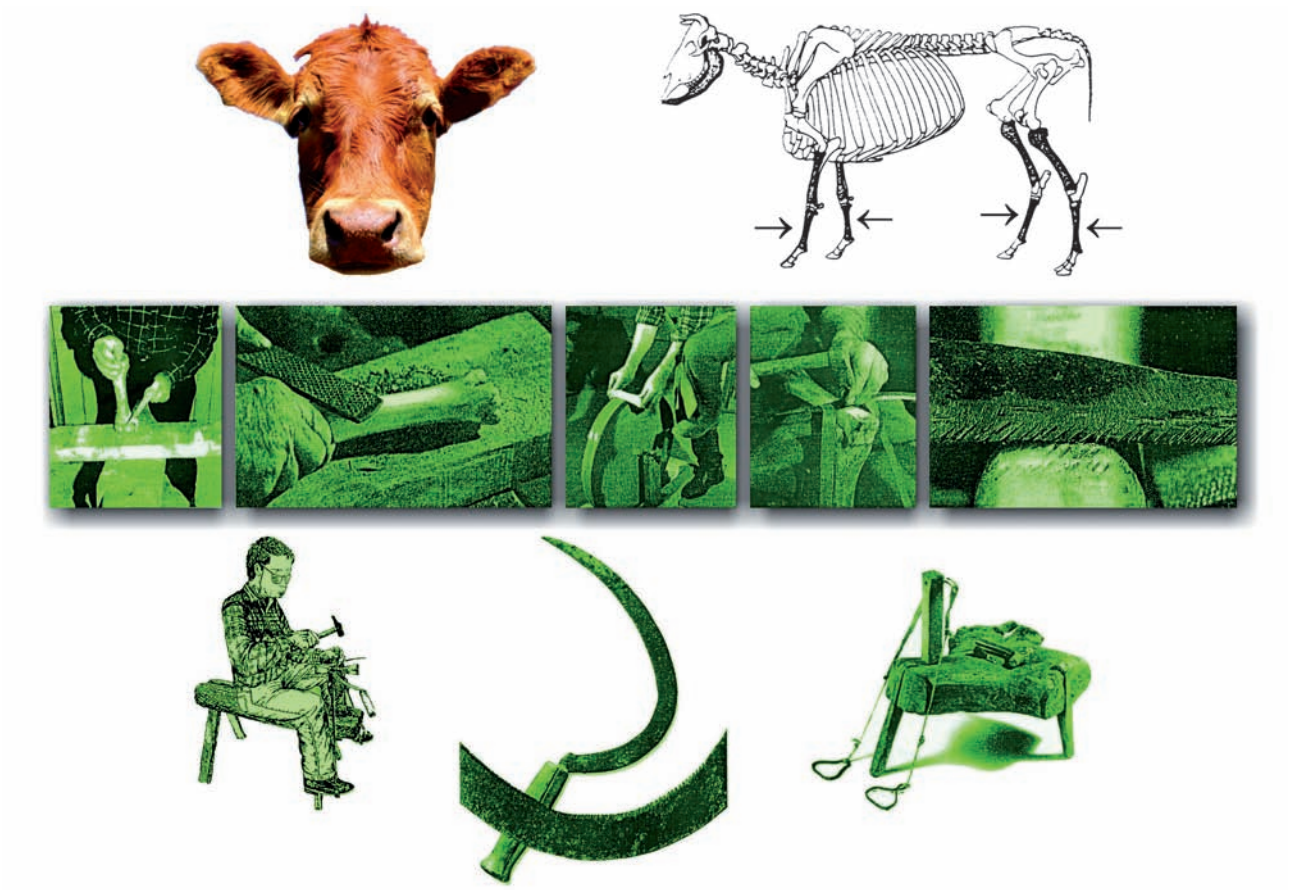

Fig. 5. Anvils on cattle metapodials: origin of raw material; phases of manufacture (façonage by chopping an polishing/abrasion); wooden installation and way of use as support for working of saw-toothed iron sickles (after Esteban Nadal, Carbonell Roure 2004:642-3, figs. 9-13; Moreno-Garcia, Pimenta, Ruas 2005:574, fig. 2; Rodet-Belarbi, Esteban Nadal, Forest, Moreno Garcia, Pimenta 2007:160, figs. 2-3)

Generally the raw materials used for these kinds of anvils were various: most of them are skeletal elements from large domestic mammals (cattle, horse, camel etc.): long bones (metapodials, tibia), mandibles, coxal bone. We also have some special cases when segments of red deer antler beams and tines were used.

Artefacts from HST-BEM are made only of cattle metapodials (metacarpal and metatarsal bones) (38 pieces). There is one exception at HST-BFL where an artefact is made of cattle metapodial and another of a red deer antler (tables 1-2; charts 1-2).

The aim of artefacts' analysis is to record all contextual, morphological, typological and technological data and to highlight the "manufacturing chain" and use wear. In this way, we may reconstruct "the technological biography" of each artefact. We currently use low power optical microscopy (4x-40x) with the aim of recording exhaustive data of the artefacts' traces of manufacture and use.

Manufacture and use

In most of the cases, the anvils were made of long bones (especially cattle and equid metapodials), but there are also cases when there have been used flat bones (like mandible). These pieces have one or more active parts shaped by chopping. They present specific triangular impressions in parallel or curved rows resulting from the operation of shaping active part of serrated sickles blades. In case of the metapodials, the surfaces of diaphysis were whittled down and smoothed. On this prepared surfaces, there are rows of triangular shaped dents. The artefacts may have one to four active parts where the smiths sharpened the serrated teeth of the sickles. The traces left by this procedure are represented by rows of triangular wholes. These rows are disposed parallel while others diverged, converged or they are crossed. The length the rows depended on

the number of dents and the separation between them. There are some cases where the diaphysis was whittled and re-smoothed for more times with the purpose of reusing the artefact (Briois *et al.* 1997; Esteban Nadal, Carbonell Roure 2004; Moreno-Garcia *et al.* 2005a, 2005b, 2007; Poplin 2007a, 2007b; Rodet-Belarbi *et al.* 2007 – with bibliography).

Presented bone and antler anvils are made of cattle metapodials (*Bos taurus*) (39) and a segment of antler beam (*Cervus elaphus*) (1).

Firstly, we take into consideration the analysis of different traces of manufacture and use, so that we may propose the reconstitution of the phases of the standard "manufacturing chain" of the anvils on cattle metapodials: no débitage; façonnage/shaping in two stages: intensive chopping and abrasion/intense scrapping using a metal blade (a knife?) – so obtaining a flat and smooth surface. This smooth surface was made on one-two-three or four bone's anatomical faces (Fig. 5).

Wear traces are surprisingly uniform; the aim of using such pieces (anvils) was to shape (sawing-toothed) the iron sickle's active part (blade) or to reshape it. After all active parts/faces of the anvils were used and entirely covered by small triangular dents/hollows. There are often situations where the smooth surfaces are reshaped – including the fragments of pieces fractured on the middle part.

Wear traces were produced while the "sickle's teeth" were shaped. The dents produced have a length of 2-3 mm and were obtained by indirect striking with hammer – with a narrow active part – the cutting edge of the sickle's blade using an iron chisel/poinçon, probably one having a triangular section. The rows of around 5-10 dents are parallel, divergent, convergent or even crossed.

Covering the whole anvil's surface with rows of dents supposed: a) the preparation and the usage of another active part of anvil; there are cases when a single piece had four active parts which corresponded to the four anatomical bone's faces; those were prepared and used successively; b) unique or double reshaping of used surface by chopping, abrasion or scraping using a metal tool, as in the first stage of shaping. All these conclusions are based on observations of microscopic traces preserved on surfaces' anvils.

Because of the renewed shaping of the anvils, the compact tissue of metapodial got thinner and very often, the artefacts broke in the middle part. This break was due to the high pressure that was applied during use. In this case, the artefact was abandoned or, if the preserved length was sufficient, it was reused/reshaped.

The "technological biographies" of the anvils are various and generally implies several stages: 1. the preparation of the active part on an anatomical face/side of the bone; 2. using and covering it entirely with dents/hollows; 3. reshaping the side; 4. reusing and covering it entirely with dents/hollows; 5. preparing the active part on the second side; 6. using and covering it entirely with dents/hollows; 7. preparing the active part on the third side; 8. using and covering it entirely with dents/hollows; 9. establishing the active part on the fourth side; 10. using and covering it entirely with dents/hollows; 11. reshaping the side; 12. reusing; 13. abandoning. There are situations when probably at least two active sides were prepared from the first stage of shaping; but this hypothesis, ethnographically supported, is difficult to argue (Esteban Nadal, Carbonell Roure 2004:640-644; Moreno-Garcia *et al.* 2005b:623-624; Rodet-Belarbi *et al.* 2007:160).

Repertoire

Hereinafter, we will present typological fiches of some representative bone and antler anvils discovered at HST-BEM and HST-BFL.

HST/2001-BEM 1 • Fig. 1. Section I. Square 3. -1.56 m. On the ground-level of the iron processing workshop • Quadruple anvil made of metapodial; unbroken; the active part was shaped on four sides; raw material: cattle metapodial (*Bos taurus*); façonnage/shaping: direct percussion/chopping on all sides; use wears: dents/triangular hollows successively generated, measuring about 1 mm in length, and deep about 1 mm, arranged in rectilinear or curved short rows, almost parallels, placed transversal or oblique on the bone's flat surface. This type of traces was generated by indirect and very precise percussion using a hammer and a small iron chisel/poinçon with a distal part having probably a triangular section and a pointed end. The tool was reshaped by direct percussion/chopping. Total length 221; length of active part 150-160.

HST/2002-BEM 3 • Fig. 1. Section I. Square 5. -1.72 m. On the ground-level of the iron processing workshop • Simple anvil made of metapodial; broken in antiquity; detached epiphyses; proximal segment; active part was shaped on posterior side; raw material: cattle metapodial (*Bos taurus*); façonnage/shaping: direct percussion/chopping on posterior side; without dents/triangular hollows or wear traces; probably broken during the façonnage/shaping. Preserved length 125; length of active part 85-100.

HST/2003-BEM 2 • Fig. 1. Section I. Square 4. -2.15 m. From the rests of the furnace content (level

of iron processing workshop) • Double anvil made of metapodial; unbroken; active part was shaped on two sides (anterior and posterior); raw material: cattle metapodial (*Bos taurus*); façonnage/shaping: direct percussion/chopping on all sides; use wears: dents/triangular hollows successively generated, measuring about 1-2 mm in length, and deep about 1 mm, arranged in rectilinear or curved short lines, almost parallels, placed transversal or oblique on the bone's flat surface. This type of trace had been generated by indirect, very precise percussion using a hammer and a small iron chisel with a distal part having probably a triangular section and a pointed end. Total length 215; length of active part 145-150.

HST/2004-BEM 1 • Fig. 2. Section I. Square 1. -1.72 m. In the area of furnace 2 (7) • Double anvil made of metapodial; broken in antiquity; active part was shaped on two sides (anterior and posterior); raw material: cattle metapodial (*Bos taurus*); façonnage/shaping: direct percussion/chopping on posterior side; use wears: dents/triangular hollows successively generated, measuring about 1-2 mm in length, and deep about 1 mm, arranged in rectilinear or curved short lines, almost parallels, placed transversal or oblique on the bone's flat surface. This type of trace had been generated by indirect very precise percussion using a hammer and a small iron chisel with a distal part having probably a triangular section and a pointed end. Preserved length 80; length of active part 75.

HST/2006-BEM 3 • Fig. 2. Section I. Square 5. -2.25 – 2.30 m. At the shaping of the "South" profile – from the rests of furnace no. 8 content; cattle metapodial; raw material; broken in Antiquity; superficial chopping at distal epiphysis at anterior side. Preserved length 177.

HST/2006-BEM 11 • Fig. 2. Section I. Square 5. -2.15 – 2.30 m. From the rests of the furnace no. 8 • Triple anvil made of metapodial; broken in antiquity; active part was shaped on posterior side; raw material: cattle metapodial (*Bos taurus*); façonnage/shaping: direct percussion/chopping on posterior side; use wears: dents/triangular hollows successively generated, measuring about 1-2 mm in length, and deep about 1 mm, arranged in rectilinear or curved short lines, almost parallels, placed transversal or oblique on the bone's flat surface. This type of trace had been generated by indirect very precisely percussion using a hammer and a small iron chisel with distal part having probably a triangular section. Preserved length 137; length of active part 50-115.

HST/2008-BFL 1 • Fig. 3. Section II. -1.13 – 1.38 m. Central nave, at the northern part of the brick pavement, from a brown level mixed with shells, rich in fragments of pottery • Simple anvil made of metapodial; broken in Antiquity; active part was shaped on posterior side; raw material: distal segment of cattle metapodial (*Bos taurus*); façonnage/shaping: direct percussion/chopping and axial scrapping on posterior side; use wears: 5 rows of dents/triangular hollows successively generated. Preserved length 75; Length of active part 45. Probably dated at about IInd century A.D.

HST/2002-BFL 6 • Fig. 3. Section I. Squares 11-12. -1.15 – 1.45 m. Site inventory no. 03[1] • Triple anvil made of red deer antler beam; secondary use of an earlier piece that had perforations at the ends, probably shaped probably as yoke – to fit across a person's shoulder so that can be carried two equal loads; raw material: red deer (*Cervus elaphus*) antler – basal segment of beam between the 2nd and the 3rd tines; the basal parts of tines are preserved; anatomic sides were shaped during first phase of manufacture using oblique chopping to remove the anatomical surface (perlure). In this way more planes were obtained, with smooth surfaces (multifaceted aspect). These sides were used in the second phase as anvils. Use wears: on the posterior, medial and lateral side of the beam segment we may distinguish rows of dents/triangular hollows successively generated, arranged in rectilinear or curved short lines; this type of traces had been generated by indirect very precise percussion using a small iron chisel with distal part having probably a triangular section and a pointed end. Some surfaces with dents/triangular hollows were reshaped using axial scraping and abrasion (secondary using). Total length 295; length of active parts 140-150; proximal end at perforation level 61/30; middle part 41/32; distal end at perforation level 62/32; diameter of perforation 10. Dated probably at about IInd century A.D.

[1] According to the preliminary available data, in previous publications 2003 is the year mentioned for the discovery of this artefact – Beldiman, Sztancs 2009a. Actually, the object was retrieved in the 2002 archaeological season.

Analogies

Anvils made of cattle or horse metapodials, tibias, mandibles, coxal bone etc. as well as those made of red deer antler were also discovered in other sites from Romania: Ostrov-Durostorum, Constanța County (ancient Roman city; discoveries in an adjacent site with carious workshops located near the

city; 4 artefacts: Beldiman, Elefterescu, Sztancs 2009; Beldiman, Elefterescu, Sztancs 2010); Chitila, Ilfov County (open-air small site belonging to Getic autochtonous population from the Roman period; 13 artefacts: Boroneanț 2003; 2005; Bălăşescu, Radu, Nicolae 2003). These discoveries represent the analogies from Romania for the artefacts retrieved at Histria which are presented on this occasion.

In this context, we should mention the unique artefact HST/2002-BFL 6, the biggest one until now (a yoke? – reused as an anvil) which, so far, doesn't have analogies in the archaeological literature consulted. Red deer antler artefacts were initially manufactured and used like anvils and are also (but rarely) published in Romanian literature. There is another piece made of a segment of an antler's beam in Romania at Durostorum (Beldiman *et al.* 2010, fig. 4 – piece DRS 4) and in Republic of Moldavia at Saharna Nouă – a piece made of a segment of antler tine (Arnăut 2007:302, fig. 1, 3).

Wear traces that are preserved on these artefacts are identical or very similar to those observed on the pieces from Histria because of their use as anvils for shaping the sawing-toothed sickles.

Aspects of the economy. Conclusion

The bone and antler artefacts, discovered at HST-BEM and HST-BFL, (the oldest known until now in Romania) are very important finds that complete the list of discoveries which add to discoveries from other Central-Eastern European sites, i.e. those from Republic of Moldova and Ukraine. Also, they are important as they provide precise data for craft activities during the IInd century AD. The presence of "Histrian anvils" provides supplementary and specific arguments for the existence of metal-working workshops in the area. The existence of bone/antler workshops are also attested in the same area by the artefacts (associated in pits with anvils), like bone and horn waste. This is why we can presume that the anvils were shaped in the workshops too. As we know, sickles were frequently used in the harvesting of cereals in many agrarian regions of the Western Pontic shore as well. Such worked bone and antler finds are not yet systematically published by the authors of excavations or by the archeozoologists; thus, the idea about spread in time and space of manufacture and use of these artefacts is still very partial for proto-historic and historic sites in Romania or other regions of Europe and Africa. For this reason anvils have been occasionally analysed.

The artefacts under discussion show the specific and unique connections between different activities (in our case, iron smelting and the manufacture of agrarian tools, the bone and antler industry and harvesting techniques). The analysis of the bone and antler pieces and also the anvils shed light on the complex problem regarding the antique economy and iron and bone & antler technology in the region of the Lower Danube[2]

The artefacts presented in this paper offer the opportunity to draw for the first time conclusions regarding the bone and antler industry at Histria. The study should be continued with further approaches regarding the pieces that were discovered in ancient archaeological excavations or in recent ones carried out in other areas of the site.

[2] For a more general discussion on the antique economy in the Dobrogea region see Suceveanu 1977, 1998.

Table 1. Istria/2001-2008 – Sector Basilica extra muros (BEM) and Basilica with Crypt ("Florescu") (BFL). Bone and red deer anvils: distribution after raw materials and year of discovery

Typological category	2001		2002		2003		2004		2006		2008		Total	
	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL
I Tools Bone anvils	3	–	3	–	7	–	12	–	13	–	–	1	38	1
I Tools Red deer antler anvils	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Total	3	–	3	1	7	–	12	–	13	–	–	1	38	2

Table 2. Istria/2001-2008 – Sector Basilica extra muros (BEM) and Basilica with Crypt ("Florescu") (BFL). Bone and red deer anvils: distribution after subtypes and year of discovery

Subtype	HST – Sectors												Total
	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL	BEM	BFL	
	2001		2002		2003		2004		2006		2008		
I	2	–	2	1	3	–	4	–	5	–	–	–	17
II	–	–	–	–	2	–	4	–	–	–	–	–	6
III	–	–	–	–	–	–	–	–	1	–	–	1	2
IV	1	–	–	–	1	–	2	–	2	–	–	–	6
UN	–	–	–	–	–	–	2	–	–	–	–	–	2
RM	–	–	1	–	1	–	–	–	5	–	–	–	7
Total	3	–	3	1	7	–	12	–	13	–	–	1	40

UN = Undetermined subtype (fragments); RM = Raw material (technically non-modified metapodials)

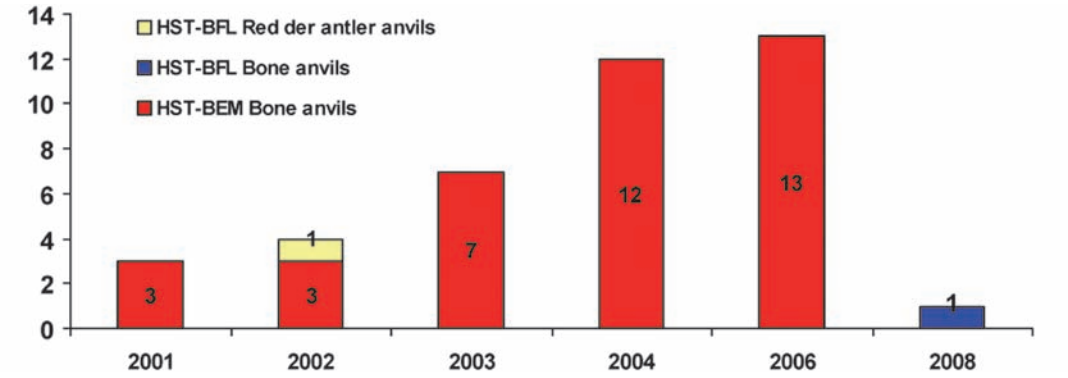

Chart 1. Istria/2001-2008 – Sector Basilica extra muros (BEM) and Basilica with Crypt ("Florescu") (BFL). Bone and red deer anvils: distribution after raw materials and year of discovery

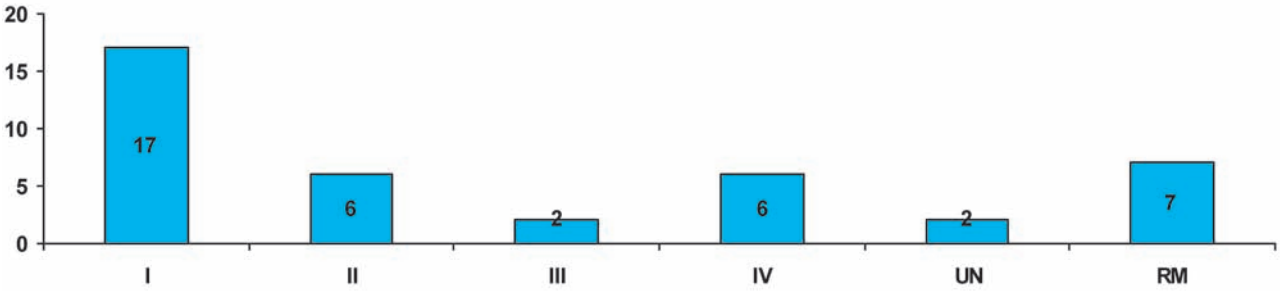

Chart 2. Istria/2001-2008 – Sector Basilica extra muros (BEM) and Basilica with Crypt ("Florescu") (BFL). Bone and red deer anvils: distribution of subtypes

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