

Middle Bronze to Early Iron Age Bone Tools from Eastern Germany

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In a rescue excavation from June to August 2001 remains of a Middle Bronze to Early Iron Age settlement were discovered in Kemnitz, district Potsdam-Mittelmark, Brandenburg about 50 km from Berlin. The excavation covered an area of roughly 120 m², not reaching the final borders of the site. Within this relatively small area 15 fireplaces built of rocks, two campfires built of pottery sherds and 45 pits were discovered (fig. 1). Charcoal samples have been radio-carbon-dated to 800 BC, but the pottery finds indicate an occupation from 1100 to 600 (Buck 2002, 71).



Fig. 1: excavation area of a Middle Bronze to Early Iron Age settlement at Kemnitz, district Potsdam-Mittelmark, Brandenburg, Germany (foto: Nordholz)

Distributed over 44 features about 700 animal bone fragments were found, which are now stored in the archive of the Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Museum (BLADAM). A small sample of these bones (53 specimen) was determined with the help of the reference collection of the Archäologisch-Zoologische Arbeitsgruppe Schleswig (AZA). The sample contained bones from domestic pig (*Sus domesticus*), sheep or goat (*Ovis / Capra*), domestic cattle (*Bos taurus*), hare (*Lepus europaeus*) and a small carnivore tooth-fragment, probably from a dog (*Canis familiaris*). Among the bone finds were five worked bones that shall be introduced here (see also Küchelmann 2002).

Three tools are of a simple type combining a grip and a tip part. Tool BLADAM 2001-779/18/3/11 was cut from long bone compacta of cattle to deer sized animals (length 58 mm, width 6 mm). Exact species determination was impossible by morphologic means. The grip part is roughly shaped with seven facets, four of which show traces of rough grinding perpendicular to the tool-axis. The grinding marks are comparable to the marks of a modern wood-rasp (cut 2). The tip is more elaborately worked and polished from all sides. Unfortunately, the point broke during excavation (fig. 2).



Fig. 2: bone tool from Kemnitz (BLADAM 2001-779/18/3/11); a) complete; b) grinding marks (fotos: Teegen)

Worked bone BLADAM 2001-779/38/3/24 derives from a cattle to deer-sized animal long bone as well, but is worked much more accurately. This 51 mm long tool is evenly ground comparable to a surface worked with modern sandpaper with a grain of 60. The grip is rectangular in cross-section (6 x 5 mm) and is provided with two convex facets and two plane facets. The latter fit perfectly between thumb and forefinger. The tip is triangular in cross-section and points downward. The point shows signs of polish, probably due to use-wear (fig. 3). Cut from the distal half of a left pig-fibula tool BLADAM 2001-779/53/3/46 needed minimum effort to get a useful shape. The fibula simply had to be sharpened proximally and was ready for work (length 42 mm, width 5 x 3 mm; fig. 4).



Fig. 3: bonetool from Kemnitz (BLADAM 2001-779/38/3/24; foto: Teegen)



Fig. 4: bonetool from Kemnitz (BLADAM 2001-779/53/3/46) and left pig fibula (foto: Teegen)

All these tools are suitable for any kind of work where a hole or an engraving in a soft material is desired. Similar tools were used from the Neolithic to the Middle Ages in different cultures (see for instance Becker 2001, 129-148; Beech 1995, 110, 140; Choyke 1996, 307, 309, fig. 3; Kokabi et al. 1994, 63-67; Maldre 2001, 21, 28; Schwarz-Mackensen 1976; Teegen 1999, 34, fig. 55, no. 3290, 4220).

A replica of tool BLADAM 2001-779/38/3/24 was built out of a piece of cattle metapodium with modern tools (saw, rasp, file, sandpaper grain 80 and 100) to test different opportunities of use. The replica was appropriate for perforating leather (fig. 5a) as well as for decorating pottery either with engraved lines or with triangular imprints (fig. 5b).



Fig. 5: testing the suitability of bonetool BLADAM 2001-779/38/3/24 for a) leather perforation; b) pottery decoration (fotos: Küchelmann)

An artefact of a different type (BLADAM 2001-779/41/3/34) was made from a right tibia of sheep or goat. The proximal epiphysis has been broken off, the diaphysis is cut obliquely beginning at the lateral side two third down the shaft and forming an eccentric tip at the medial side directly above the base of the distal epiphysis. The cutting facet is 40 mm long, the remaining length of the object is 102 mm. Six facets are visible, all show traces of rough grinding perpendicular to the axis of the bone. No effort was made to smooth the surface. The tip is broken in the past (fig. 6).



Fig. 6: spear- or lancehead from Kemnitz (BLADAM 2001-779/41/3/34) and right sheep tibia (foto: Teegen)

Comparable artefacts were found at Hjortspring, Denmark. At this famous Iron Age bog sacrifice site (3rd century BC) among other finds 169 spearheads were discovered. 26 of these spearheads were built from long bone shafts, most of them from tibiae of sheep or goat as the find from Kemnitz. They were fabricated in the same manner and had a comparable size (95 to 130 mm; fig. 7a). The Hjortspring spearheads were mounted to approximately 2 m long ash wood shafts either by rivets or glue (<http://home6.inet.tele.dk/hjortspr/spears.htm>). Similar projectile points were found together with remaining parts of the shaft in the Neolithic settlements at the lake of Biel, Switzerland (Kokabi et al. 1994, 45-46). According to the similarity the artefact from Kemnitz could have been a spear- or maybe lancehead as well. Broken points are typical features of an impact on a hard material and are indicators for the use of an artefact as a projectile (Petillon 2006, 85-98; Stodiek 1991, 250-254; Stodiek & Paulsen 1996, 19, 35). The damaged point of the Kemnitz find resembles those shown by Petillon (2006, 89-93) and Stodiek (1991, 253).

To get some ideas about the way of producing a spearhead like this, a replication was tried. Holding a sheep tibia upright in one hand with its distal end on the ground and chopping off flakes of bone with a knife or an axe to get an oblique tip, turned out to be a rather ineffective and inaccurate method. When the tibia was laid down with its caudal side flat on the ground instead – which is the only stable position to lay down a sheep tibia due to the margo cranialis – the cutting facet is positioned exactly perpendicular to the facies caudalis. So the general shape can be produced by one single strike with an axe in an oblique angle to the shaft axis (fig. 7b). Furthermore, it turned out to be impossible to form a cut proceeding from the lateral to the medial side on a right tibia with the axe held in the left hand (not necessary to mention that I'm left-handed). If the spearhead was produced by this easy method, the craftsmen must have been right-handed.



Fig. 7: a) spearheads from Hjortspring, Denmark (from Kaul, foto: Larsen); b) replication of a spearhead from a left sheep tibia by a left-handed person (foto: Küchelmann)

One 42 mm long fragment from the right tibia of a hare (fig. 8a; BLADAM 2001-779/38/3/23) is probably not a tool in the strict sense that it has been worked intentionally to be suitable for a certain purpose. This specimen is provided with an high number of sub-parallel scraping or grinding marks perpendicular to the bone axis on each of the three sides (fig. 8b). What this bone has been used for remains uncertain. However, the similarity of the pattern to marks on bones used as anvils (Moreno-Garcia et al. 2005) suggests that it may have been used as support for some kind of work.



Fig. 8: a) worked hare tibia fragment from Kemnitz (BLADAM 2001-779/38/3/23) and right hare tibia; b) grinding marks (fotos: Teegen)

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