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Curry-comb or toothed weft-beater? The serrated iron tools from the Roman Pannonia

Introduction

Functional identification of tools from archaeological contexts is never an easy task for scholars of past technologies. Some basic implements have been used for a very long time, but the formal similarities of these ancient objects to present-day ethnographic items can result in the misinterpretation of their function. One of the aims of this paper is to specify the function of a certain iron implement known from Roman Pannonia. By focusing on its archaeological context and functional characteristics it is hoped that a more precise functional identification may be possible.

The tools in question are elongated rectangular iron blades 20-30 cm long, serrated with short teeth

(usually 1-2 per cm) along one of their longer edges and with an iron tang for the handle at a right or an obtuse angle in the middle of the other. Usually, at each corner of this latter edge, they have one wavy prong bent back to the blade with a ring hanging from it (Fig. 1). To date, at least 35 iron objects of this type are known among the archaeological finds from Pannonia:

1. Bátaszék, grave 56. (Péterfi 1993, 57-58 and Tab.VI. 56.3);
2. Bátaszék, grave 102. (Péterfi 1993, Tab. XIV. 102.8);
- 3-4. Balatonaliga (Henning 1987, Cat. Nr. 20);
- 5-6. County Baranya, stray finds (Müller 1982,

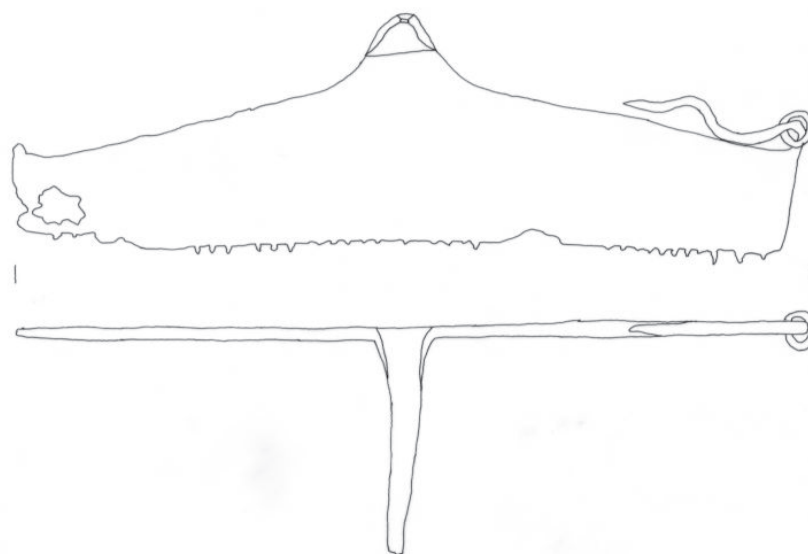


Fig. 1. Toothed iron weft-beater, Keszthely-Fenekpuszta Inv.nr. 58.21.14 (© Rupnik László).



- Cat. 2030-2031);
7. Budakalász, *burgus* (Dinnyés et al. 1986, Tab. 33.10);
 8. Intercisa, *castrum* (Henning 1987, Cat. 149);
 9. Intercisa, *canabae* (Müller 1982, Cat. 175);
 - 10-11. Hajmáskér-Seghegy (Éri et al. 1969, 99 and Tab. 18. 14; Müller 1982, Cat. 275-276; Henning 1987, Cat. 200);
 12. Keszthely-Dobogó, grave 111. (Sági 1981, 75. and Abb. 57. 22; Müller 1982, Cat. 366);
 - 13-17. Keszthely-Fenekpuszta (Müller 1982, Cat. 464-468) (1);
 - 18-21. Leányfalu, *burgus* (Müller 1982, Cat. 511-513; Dinnyés et al. 1986, 116; Henning 1987, Cat. 274);
 22. Somogyzil, grave 67. (Burger 1979, 13 and 37-8; Abb. 44; Taf. 12.3; Taf. 43);
 23. County Tolna, stray find (Henning 1987, Cat. 523);
 - 24-25. Tác, building I. (Thomas 1955, 130. Nr. 19-20. and Taf. XXXIII.1-2; Thomas 1964, Taf. CCXIII; Müller 1982, Cat. 917-918; Henning 1987, Cat. 535);
 26. Tác, sector 140/780. (Fitz-Bánki 1974, 209. vasak 1. and Fig. 20.1; Müller 1982, Cat. 919; Henning 1987, Cat. 535);
 27. Tác, sector 185/815. (Müller 1982, Cat. 920; Henning 1987, Cat. 535);
 28. Tác-Margittelep, grave 216. (unpublished);
 29. Veszprém-Ranolder street (Müller 1982, Cat. 1683);
 - 30-31. County Veszprém, stray finds (Müller 1982, Cat. 2028-2029);
 32. Tatabánya-Felső-Rét-föld (László forthcoming, Cat. 2 and Tab. I.2);
 33. Visegrád-Gizellamajor (Gróf- Gróf 1991, 89; Gróf 1992, 130);
 - 34-35. Alsóheténypuszta (unpublished).

The earliest of these items may have already been in use during the 2nd -3rd centuries AD, but from the 4th century AD onwards, there is no doubt about their use. In Pannonia, they have been found in settlements, but not in urban contexts: some come from surveys of possibly 2nd-4th century AD villa-estates (Cat. Nos. 3-4; 10-11); others from the 4th AD century inland forts (Cat. Nos. 13-17; 34-35), or from the 4th century AD fortified settlement with unclear status at Tác-Fövenypuszta (Cat. Nos. 24-27) as well as from the 4th century AD military watchtowers of Leányfalu (Cat. Nos. 18-21) and Budakalász (Cat. No. 7). Additional five items are known from 4th century AD burial contexts: four come from different rural cemeteries south of the lake Balaton (Cat. Nos. 1-2; 12

and 22) and one from the cemetery at Tác-Margittelep belonging to the above mentioned settlement in Tác-Fövenypuszta (Cat. No. 28). One additional item was found together with some agricultural tools in an iron hoard from Tatabánya-Felső-Rét-föld (Cat. No. 32). Parallels to these objects are well known from outside Pannonia with some evidence from the 2nd century AD, but the bulk dated between the 3rd-7th centuries AD (Müller 1982; Henning 1987; Gaitzsch 2005). Some morphologically identical items have also been noted from even later archaeological contexts (Nikitin 1971; Kirpichnikov 1973; 1986). They have been primarily found in the Balkan Peninsula, although occasional items are known from Italy (Rich-Chérueil 1859, 224 (under *Dens*) and 394 (under *Marra*); Gaitzsch 1980, 362. Cat. 177-180, Taf 37. 177-180), Gaul (Champion 1916, XIV. 16852; Marichal 2000, Cat. 94-100) and Asia Minor (Gaitzsch 2005, 129, Taf. 215. STR2).

Based on some morphological similarities to modern ethnographical analogies, these toothed iron tools are usually published as curry combs for horse-grooming. Differing from this generally accepted identification, an alternative possibility will be presented here.

Function: a curry-comb?

Probably the first published evidence for these toothed iron tools comes from the 19th century as a very schematized line-drawing in a widely used Latin dictionary, which depicts an object identical to those described above, originally found in a burial (Rich and Chérueil 1859, 224 (*Dens* 5.) and 394 (*Marra*)). It was published as an illustration for the *marra*, a Latin agricultural implement probably with the combined function of a rake and a hoe (the French *sarcloire*), which is often mentioned by the ancient sources (White 1967, 41-42). The author's explanation for the burial context is that the ancient Christian martyr lying in this grave had been tortured to death by the teeth of this tool (2).

According to the generally accepted and a less gruesome opinion they are believed to have been used as curry-combs for grooming animals (Kirpichnikov 1973, 85; 1986; Müller 1982, 532-4; Gaitzsch 2005, 129), although some doubts about the practicality of their sharply pointed teeth for grooming livestock have been voiced, and as a result another function as a scraper for processing hides has been suggested (Petó 1973, 72).

It was Károly Sági who, instead of searching for morphological analogies among ethnographical objects, for the first time made a suggestion based on the analysis of the archaeological contexts of the



Pannonian finds. His arguments focused on two female burials from the 4th century AD (Cat 12 and 22), each of which contained a toothed iron tool as well as other textile tools: in one case a spindle whorl, and in both cases an approximately 20 cm long iron spike with circular cross-section and one pointed end. According to Sági, the latter could be interpreted as a distaff (see below) and the toothed iron tool as a weaving comb (Sági 1973; 1981). His idea has never found general acceptance by his colleagues, since it was Sági himself who undermined the plausibility of his own arguments by including a badly chosen and incorrectly oriented illustration in his publication. While he was arguing that these iron weaving combs could have been perfectly suitable for beating the weft thread into its place *downward on a loom*, the image of the warp-weighted loom (Fig. 2) illustrating his point was inserted upside down (Sági 1973, 293-294 and fig. 66; Sági 1981, 75-76 and fig. 22). The most generally accepted theory - that the serrated tools were used as curry-combs for animal-grooming - is based on the fact that a great number of these objects were found in the Balkan Peninsula in iron hoards consisting of predominantly agricultural implements. Consequently, the scholarly interest turned towards finding morphological analogies to these toothed iron tools among the agricultural activities from later historical periods. A perfect

match was assumed to have been found among the ethnographical objects used in animal husbandry (Kirpichnikov 1973; Müller 1982, 384). These metal tools have either angular or semi-cylindrical iron blades serrated along both longer edges and either a single-, double- or triple-armed tang riveted to the blade (Fig. 3). Sometimes, the two side arms of the tang carry loose iron rings. Starting in the 12th-13th century AD such metal curry combs were used for removing dead hair, scurf and caked dirt by grooming the animal all over (Fig. 4; Müller 1982, 384; Mesterházy 1983, 155; Clark 1995, 157-165; Paládi-Kovács 2001, 643-651; Terei-Horváth 2007, 231). Based on these analogies, a chronological sequence of development was proposed for these curry-combs: the simple single-edged items from the Roman period (type I) presumably appeared as early as the 2nd century AD; by the 14th century AD they were completely replaced by the curry-combs with double-edge of n blade bent at an angle or in a semicircle (type II), which were used occasionally already during the 12th century AD. Finally, curry-combs with triple edges appeared during the 16th-17th century AD (Müller 1982, 384 and fig. 34).

An alternative suggestion: a weft-beater

Contradicting to this neatly built evolutionary typology of the metal curry-comb is an even



Fig. 2. Greek skyphos with the depiction of a warp-weighted loom (after Stærnøse-Nielsen 1999, 69).

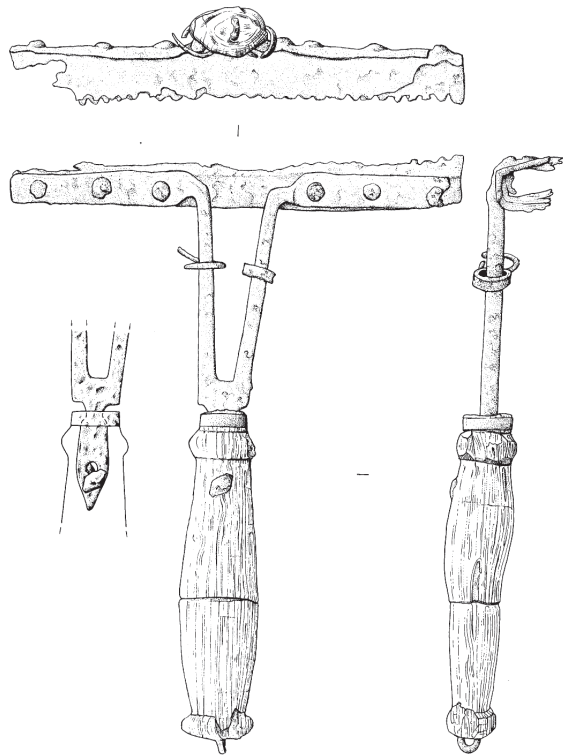


Fig. 3. Medieval curry-comb (after Clark 2004, 164, fig. 122).

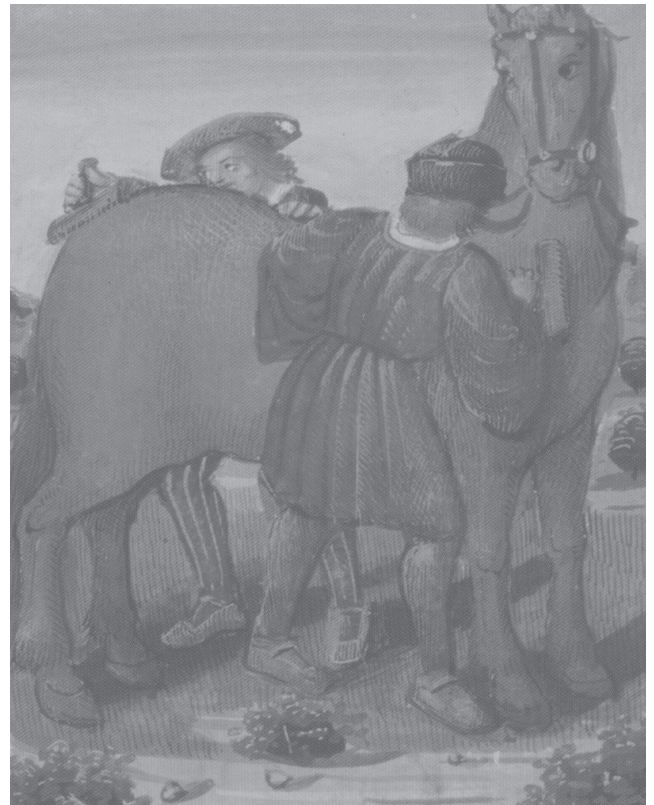


Fig. 4. Curry-comb in use on a 16th century AD depiction (Clark 2004, 157 and fig. 114).



Fig. 5. Toothed weft-beaters from Çatalcam, Turkey (© Jørgen Christian Meyer).



closer morphological parallel found in the modern ethnographical material, which provides another plausible explanation of its function. Examples almost identical to our Roman iron tool are used in the modern village Çatalcam in Turkey for beating the weft into its place while weaving kilim carpets on two-beam upright looms (Figs 5-6). Similar examples are also well known from Morocco, where they are used for weaving finer textiles on the same kind of loom, following the local traditions which might go back at least to the Roman era.

There is ample evidence for the use of a very similar toothed iron blade mounted in a wooden handle could from the first half of the 20th century in the workshops in Greece, Palestine, Turkey, Syria and even in Hungary, where the two-beam upright loom was in use for preparing the coarse fabric for tent-coverings, sacks and bags (Ébner 1931; Morton 1936, 63-64; Crowfoot 1936-37; 1941; Dalman 1937; 107-129; Domonkos 1954; 2000; Szolnoky 1954; Báldy Bellovics 1974; Broudy 1979; Lukács 2007, 69; Ciszuk

and Hammarlund 2008, 125). All these looms from modern Turkey, Morocco, Greece, Syria or Hungary could be the direct descendants of a vertical two-beam loom which is generally considered to be widely used in the entire Mediterranean area from the 1st century AD (Crowfoot 1936-37, 40; Dalman 1937, 107-129; Wilson 1938, 23-25; Crowfoot 1941, 148; Forbes 1956; Wild 2002, 11) (3).

Although several depictions of this two-beam vertical loom are known from the Roman period, none of them shows any other tool except a single-ended pin-beater (4). In contrast to this iconographic evidence, ancient literary sources mention a certain *pecten* ('comb' in Latin), a type of tool with notched teeth, which was used for beating in the weft as part of the weavers' tool-kit together with the *radius* (most probably a pin-beater) while weaving on a vertical two-beam loom (Crowfoot 1936-37; Wild 1967). Depictions of the vertical two-beam loom continue after the end of the Roman era and some of these later representations illustrate very clearly a toothed weft-beater in use. The earliest example is a miniature in the Utrecht Psalter, *Folio 84 recto*, dated to the 9th century AD (DeWald 1932, Pl. CXXXII) and its later copy in the Eadwin Psalter in Cambridge dated to the 12th century AD (Hartley and Elliot 1951, Pl. 22a; Hoffmann 1988, 242 and 243 fig. 6; Walton Rogers 1997, 1759). These images provide a profile view of the tool (Fig. 7), while a frontal view was drawn by Hrabanus Maurus in a miniature of an Italian manuscript dated to AD 1023 (Fig. 8; Ling Roth 1917, 137 and Fig. 91c and 144; Nahlik 1963, 278; Broudy 1979, Fig. 3-34; Kolchin 1989, 122). The latest found example is from a 13th century AD Byzantine manuscript, where a toothed weft-beater is probably depicted lying on the ground under the loom (Huber 1986, 233 and nr. 224; Constan 2003, 335 and fig. 1).

The Pannonian evidence

A closer look at the archaeological evidence from Pannonia allows us to further suggest that the elongated iron blades toothed along one of their longer edges and with a tang at right or obtuse angle in the middle of the other were not used for grooming animals, but rather utilized as textile tools for weaving on the vertical two-beam loom.

Five examples are known from 4th century AD burials in Pannonia: one from the inhumation burial nr. 216 at TÁC-Margittelep (Cat. No. 28), one from the inhumation grave nr. 67 at Somogyszil (Cat. No. 22), another from the cremation grave nr. 111 at Keszthely-Dobogó (Cat. No. 12), and further two items from the inhumation burials nr. 56 and 102 at BÁTASZÉK (Cat. Nos. 1-2). In each case the deceased



Fig. 6. Toothed weft-beater in use, Çatalcam, Turkey (© Jørgen Christian Meyer).

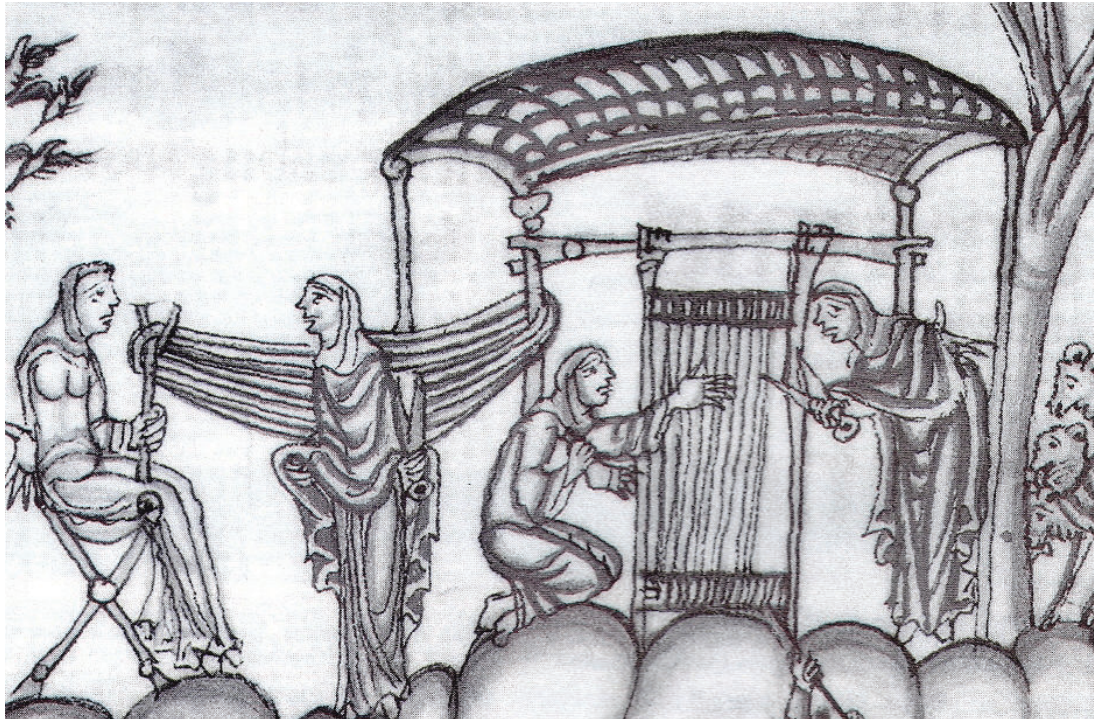


Fig. 7. Depiction of a two-beam upright loom and a toothed weft-beater in the Eadwin Psalter (after Walton Rogers 1997, 1759).



Fig. 8. Depiction of a two-beam upright loom and a toothed weft-beater by Hrabanus Maurus (Broudy 1979, Fig.3-34).



Fig. 9. Tombstone of Severa Seleuciana (after Johl 1924, 2. Abb. 2).



was a female. In two cases (Cat. Nos. 1 and 12), the toothed iron tool was found together with a spindle whorl, and in four cases (Cat. Nos. 1, 2, 12 and 28) together with a 20-30 cm long iron spike pointed at one end and a round cross-section.

As mentioned above, the function of these iron spikes, which are characteristic finds in the rural cemeteries of the 4th century AD, in the region of Pannonia south of the lake Balaton, has been interpreted in various ways: either as barbecue spits (Dombay 1957, 289; Vágó-Bóna 1976, 182; and recently Tóth 2006); or, in a possible association with textile production, as spindle shafts or distaffs (Sági 1973; 1981; Bíró 1994; Kelemen 2008; Müller 2009, 43-45). Although they could have been used for producing yarn, they are more likely to be connected to weaving than spinning.

For weaving on a vertical two-beam loom, a pointed spike, the so-called pin-beater (the Latin *radius* or the Greek κερκίς) was used to clear the shed (Crowfoot 1936-37; 44-45; Dalman 1937; Wild 1967). The weft was passed through the shed by hand as a small skein or wound around a stick, and arranged with the pin-beater before beating it in downwards with

the toothed weft-beater. The beating in with the toothed weft-beater was needed to give the close weave desired, but if there was any unevenness the pin-beater could be used to pick at individual threads until they would lie close and even (Crowfoot 1941, 144-146; Ciszuk-Hammarlund 2008, 124). The pin-beaters were in use during the Roman period as documented by iconographic evidence where they are depicted side-by-side with the vertical two-beam loom (Figs 9 and 10). Usually the pin-beaters were made of wood or bone, but they could also be made of metal. Grace M. Crowfoot reported on an iron item which had been used as a pin-beater in the 1930s (Crowfoot 1936-37; 44), while literary sources from earlier periods refer to the weavers' 'iron nail' or 'iron awl', testifying that at least in Palestine a pointed iron implement was in the weavers' tool-kit as a pin-beater (Dalman 1937, 112-129).

Thus, both iron tools - the pointed pin-beater as well as the serrated weft-beater, which were found together in the Pannonian burials - could have been used for weaving on the same kind of loom, namely the vertical two-beam loom. They were not very suitable for the use with the two other types of loom known from the Roman period (for the three types of Roman looms, see Ciszuk and Hammarlund 2008 with bibliography). It is not surprising that, as grave goods, they were often deposited in the burials together with spindle whorls, while as finds from the settlements, the iron toothed weft-beaters were found in areas where textile producing activities have been documented (Thomas 1955).

Further perspectives

Looking at certain characteristics of a textile tool can give us further clues as to what the qualities of the textiles produced with their help might be. In the case of the toothed iron weft-beaters, the characteristics to be considered are the weight and width of the blade as well as the density and length of the teeth. The weight of the weft-beaters could have a crucial effect on the weft density of the fabric since high weft density demands harder/heavier beating. Unfortunately, this parameter is never provided in the publications of the archaeological finds from Pannonia. The ethnographic weft-beaters have a wide weight range: a Moroccan item weighs 125 g, while a specimen from Palestine procured for the Bankfield Museum, Halifax weighed ca. 3,6 kg (Crowfoot 1941; 144-145). It should also be kept in mind that with a higher weight and perhaps width the same result can be achieved as with a lighter and narrower tool, but the former would require a reduced number of the beat-in motion.



Fig. 10. Tombstone of Genetiva from Gaul (Walton Rogers 2007, 35, fig. 2.27).



Archaeological publications provide more data about the width and the teeth density and length of these weft-beaters. The width ranges between 20 and 30 cm, which is not very suitable for the weaving of a patterned fabric (e.g. a kilim), where only smaller portions of different colours are prepared at the same time. For the weaving of such fabric a shorter blade is more appropriate and a wider tool might even hinder the work.

Although the density of the teeth is usually not reported in the descriptions of these objects, their scaled photographs or drawings allow to calculate that most of them had 1-2 teeth per cm. Thus, they appear to be most suitable for the preparation of fabrics with low warp counts. The length of the teeth, which is never above 5-6 mm, is also a very important characteristic in relation to the thickness of the produced fabric. Based on ethnographic data, the weft-beaters which are used for making piled carpets usually have much longer teeth; hence these short toothed tools are not suitable for such fabrics.

Thus, by considering the morphological characteristics of these toothed weft-beaters, we can exclude some less likely alternatives (piled or tapestry fabrics) from among the possible textile products.

Conclusion

Both close morphological similarities to modern parallels and Pannonian archaeological contexts strongly suggest that the original observations of Károly Sági were correct and these toothed iron tools were not used as curry-combs for grooming animals, but for producing textiles on a two-beam upright loom. This conclusion is of great importance because the iron weft-beaters (and the iron pin-beaters) provide us with a valuable clue to the presence use of a loom which in contrast to e.g. the warp-weighted loom hardly left any traces in the archaeological material of the Roman provinces.

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Notes

1. Kuzsinszky 1920, figs. 84-85: altogether 16 items of this kind are visible here.
2. Although there is no explicit reference in his text to Saint Blaise, we can suppose that Rich had the iconographical emblem of this saint in his mind (see Cardon 1999, fig. 52 and Chaloner 1957). This 4th century AD Christian martyr was believed and depicted to have been torn apart with wool combs before being beheaded, but these wool combs with their long spikes usually embedded in a wooden head with long handle are very different from the iron items serrated with short teeth. For these wool-combs and their use for torturing people in Nordic sagas, see Hoffmann 1964, 284-285.
3. It is noteworthy that several parts of this loom used in the Hungarian workshops of 1930s were called by loan-words from south Slavic languages, which is an indication of its northward spread from the Balkan Peninsula to the Carpathian Basin during the Middle Ages or later (Ébner 1931, 168).
4. Three identical two-beam looms are shown on the frieze of the Forum Transitorium in Rome (Wild 1970, 69; D'Ambra 1993). On the left of the sketched outline of a two-beam loom represented on the 3rd century AD tombstone of Severa Seleuciana from Rome a one-ended pin-beater is depicted (Fig. 7; Johl 1924, 2, Abb. 2; Wild 1970, 69). Similar loom is depicted on a 3rd century AD wall-painting in the hypogeum of the Aurelii in Rome (Wilson 1938, 21; Wild 1970, 69-70; Broudy 1979, 48), and on the tombstone of Genetiva from Gaul behind her left shoulder in profile. In the later, the deceased holds a pin-beater in her right hand and a skein of thread in her left (Fig. 8; Roche-Bernard and Ferdieri 1993, 144). The latest Roman depiction appears in a miniature of the early 5th century AD Codex Vaticanus 3225, Pict.39 (Ciszuk and Hammarlund 2008, 125).

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