THE HORSE IN ESTONIA IN THE LATE BRONZE AGE: ARCHAEOZOOLOGICAL AND ARCHAEOLOGICAL DATA

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Abstract

In the article a survey is given of the information about horse and its exploitation in the Late Bronze Age in Estonia. Concerning the archaeozoological material the finds of horse bones in the Late Bronze Age are discussed. The analysis of finds discusses the bone artefacts connected with the exploitation of horse and artefacts made from horse bones.

Key words: Late Bronze Age, Estonia, horse exploitation, faunal remains, bone artefacts.

Introduction

Horse occupied an important place in the Bronze Age society in many places in Europe, its ritual importance as well as its significance as a status-connected possession have been emphasised (e.g. Ullén 1996; Choyke *et al*. 2004; Bradley 2005, p.172). The aim of this article is to give a survey of the information about horse and its exploitation containing in the archaeological material of the Late Bronze Age in Estonia. Concerning the archaeozoological material a brief survey of the finds of horse bones in Estonia is presented and the finds from the fortified settlements of the Late Bronze Age, particularly from the settlements of Asva and Ridala on Saaremaa, are discussed more thoroughly. The analysis of archaeological finds discusses the horse-related bone artefacts of the Bronze Age from two aspects: artefacts connected with the exploitation of horse and artefacts made from horse bones.

Fig. 1. Late Bronze Age fortified settlements in Estonia (drawing by K. Siitan).

The discussed period, the Late Bronze Age, is dated to 1100–500 BC in Estonia. It is the time when fortified settlements first appear in the settlement pattern. The number of such fortified settlements in Estonia is small and they are all located near the coast or on the island of Saaremaa (Fig. 1; Lang 2007, pp.15 and 55 ff.).

Archaeozoological data: finds of horse bones in Estonia

Wild horse belonged in our fauna already in the Boreal period. The earliest known finds come from the Lammasmägi of Kunda (eight–fifht millennium BC), where they constituted 0.5 % of all bones. The earliest maximum of wild horse most likely appeared in the Atlantic period. A total of 282 bones of wild horses was recovered from the settlement site of Kääpa; in the lower horizons of the cultural layer they constituted 4.0%, in the upper ones 1.5% of all bones. A few bones of this species were recovered from the Neolithic settlement sites of Akali, Villa and Tamula (the Subboreal period) (Paaver 1965b, p.180ff). No bones of domestic animals (with the exception of dog) have been found from the settlements of Kääpa and Villa, so it is unlikely that the horse bones belonged to domesticated animals. As for the settlements of Akali and Tamula, their cultural layer contained a few bones of domestic animals, which permits to presume also the occurrence of domestic horse. Since corded pottery occurs in the cultural layers of these settlements one may also assume that bones of domestic animals are connected with the people of the Boat Axe Culture (Jaanits *et al.* 1982, p.105; Lõugas *et al*. 2007, p.25ff). Bones of goat, sheep, pig and cattle, as well as artefacts made from goat or sheep bones have been found in the graves of the Boat Axe Culture, while horse bones are missing there. Thus it is most

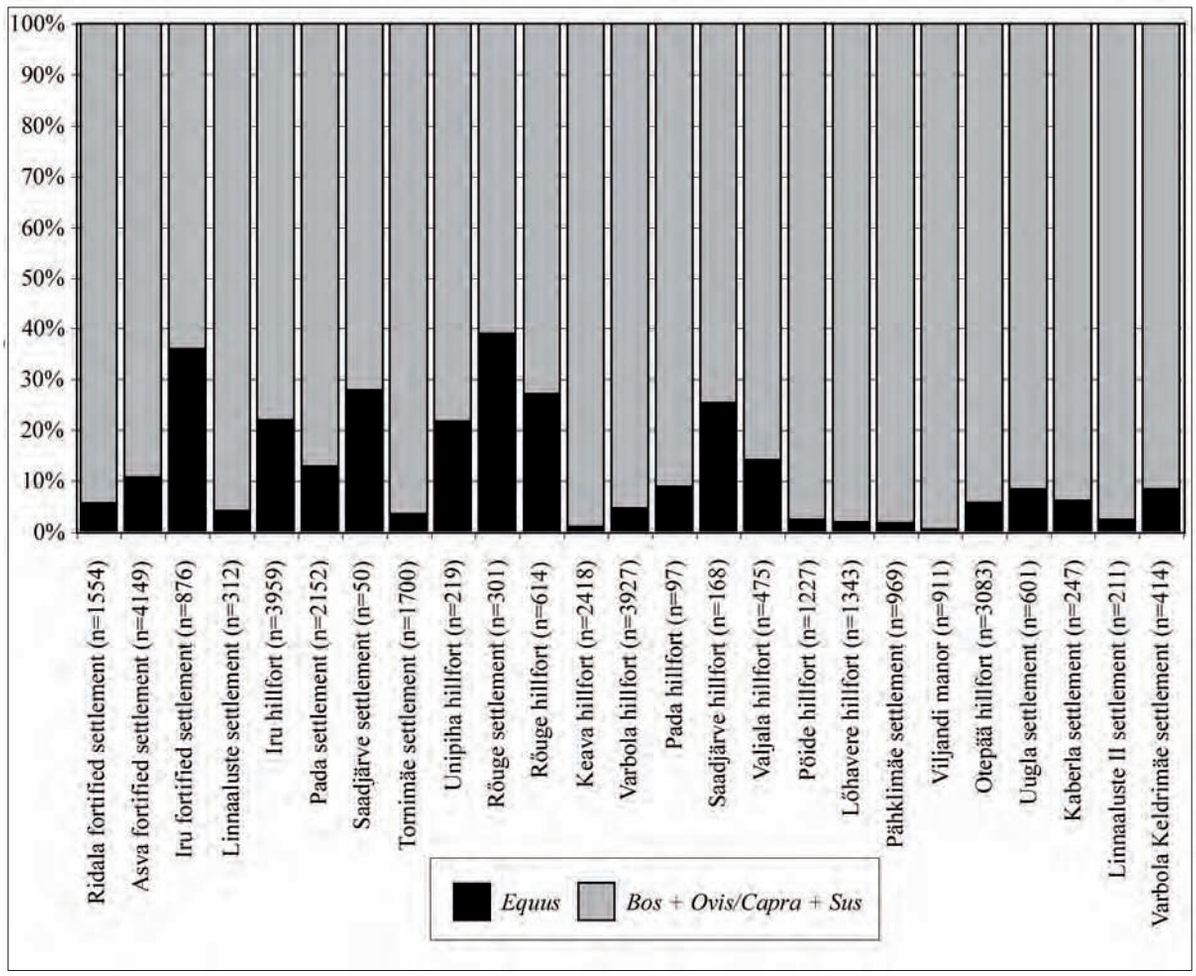

Fig. 2. Finds of horse bones in Estonian Bonze Age, Iron Age and Medieval sites (prepared by Maldre, compiled after: Haak 2007; Lõugas 1994; Maldre 1997; 2003a, 2005, 2006, 2007, 2008a, 2008b, unpubl.; Paaver 1965a, 1965b, 1966, 1970; Saks and Valk 2002).

likely that horse bones found from Akali and Tamula still belong to wild horse.

It is not known when exactly domesticated horse reached Estonia. Bone materialis not known from the Early Bronze Age but since the Late Bronze Age horse occurs, in varying extent, in all investigated sites. It seems that horse bones were more numerous in the settlements and hillforts of the Late Bronze Age and the Viking Age (material of the earlier stage of the Iron Age is unfortunately missing in Estonia). The number of horse bones is higher among the material from South and Southeast Estonia and possibly also from eastern Estonia. Among bones from medieval towns horse is represented very modestly (Fig. 2).

The archaeozoological material of the Bronze Age graves of Estonia has not been thoroughly investigated yet. A brief survey of bones from the stone cist graves of Rebala revealed a few horse bones but their direct connection with burials is questionable. The stone cists did not contain any horse bones, or any animal bones at all; some horse teeth and a fragment of a temporal bone occurred among the bones but they were not found together with human bones. A few horse bones have been found also in the tarand-graves of the Pre-Roman and Roman Iron Ages, but in these cases their connection with burials is also questionable. Horse bones and teeth occur among other animal bones in the stone graves of Northeast Estonia, they have been found from the stone grave of Muuksi (Schmiedehelm 1955, p.46), as well as from the stone grave of Nehatu in Iru (Lang 1996, p.120). In Estonian context the barrow cemeteries with cremation burials in Southeast Estonia, dated to the fifht–tenth centuries, are exceptional with their abundance of horse bones and nearly complete absence of bones of other animals (Allmäe and Maldre 2005; Allmäe *et al*. 2007a; 2007b). In the barrow cemeteries of Southeast Estonia there are not single finds of horse bones, there one can speak about cremation burials of whole horses. In the Late Iron Age graves, at least in West Estonia and Saaremaa, horse bones have not been hitherto discovered (Maldre 2003b).

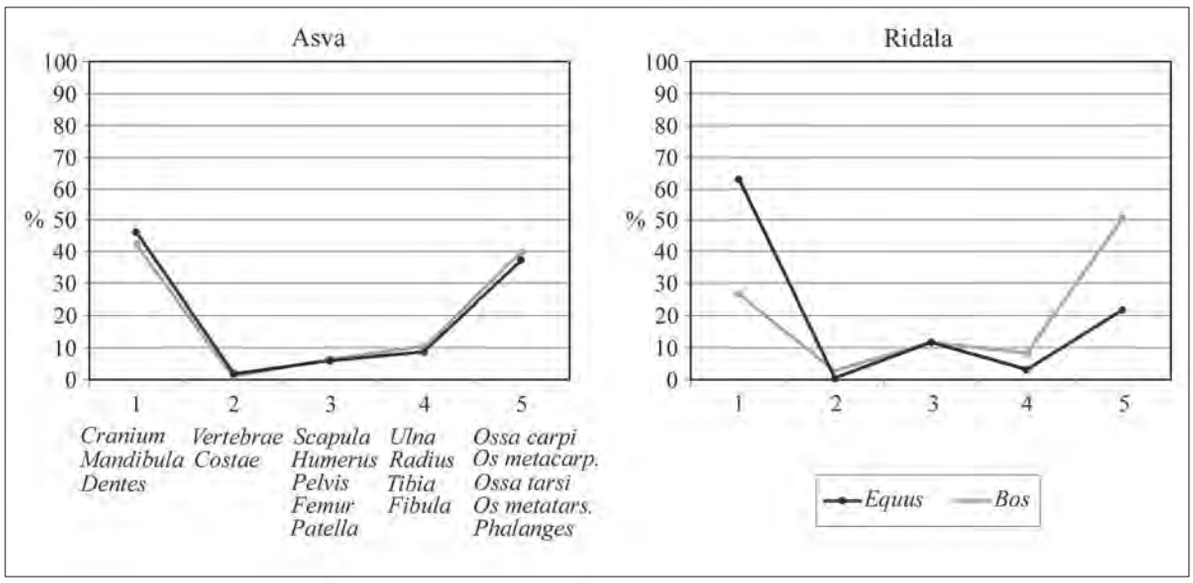

Fig. 3. Both in Asva and Ridala the state of preservation of horse bones and cattle bones is similar (prepared by Maldre).

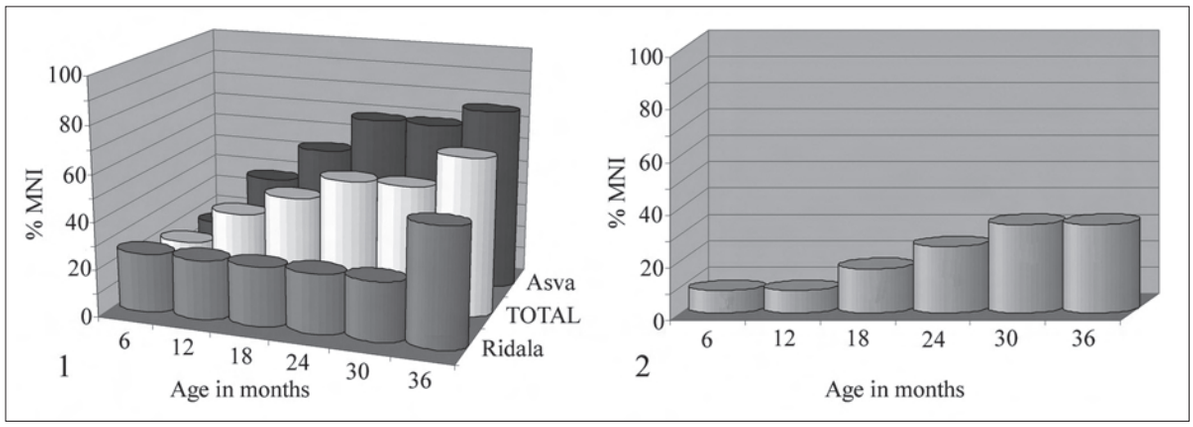

Fig. 4. Ages of horses from Asva and Ridala Late Bronze Age fortified settlements (1) and from Pada Viking Age settlement site (2) (prepared by Maldre).

Archaeozoological data: horse bones in Estonian Bronze Age settlements

The quantity of horse bones among osteological material from the Late Bronze Age settlements in Estonia varies greatly. In Saaremaa, both in Ridala and Asva fortified settlements, horse is only modestly represented. The percentage of horse bones is considerably higher in the fortified settlement of Iru, North Estonia (Paaver 1966). Unfortunately only species' composition of animal bones from Iru is known at the moment, data about slaughtering ages of animals and anatomical structure of bones are missing and therefore it remains unclear what was the cause of such high percentage of horse bones (Fig. 2).

Both in Asva and Ridala the state of preservation of horse bones and cattle bones is similar (Fig. 3). The anatomical distribution of the bones of these two species is also very similar in Asva (Fig. 3.1). In Ridala differences are somewhat bigger, especially concerning bones of head and distal parts of limbs (Fig. 3.2). These differences were caused by the large number of separately found horse teeth – in the osteological material from Ridala teeth constituted 58% of all found horse bones (Maldre 2008a, p.270); in the material from the excavations of 1939 and 1965–1966 of Asva the percent is only 29 (Lõugas 1994, table 2; Maldre unpubl.). The small amount of bones from fleshy parts of carcass is due to the fragmentariness of material – the number of fragments of these bones is large but the majority of them cannot be determined to species.

Horse bones found from Ridala belong to at least 8 horses; in the osteological material from the excavations of 1939 in Asva remains of at least 15 specimens could be determined. Most of the bones belong to young animals (Fig. 4.1). 15%–25% of animals (the

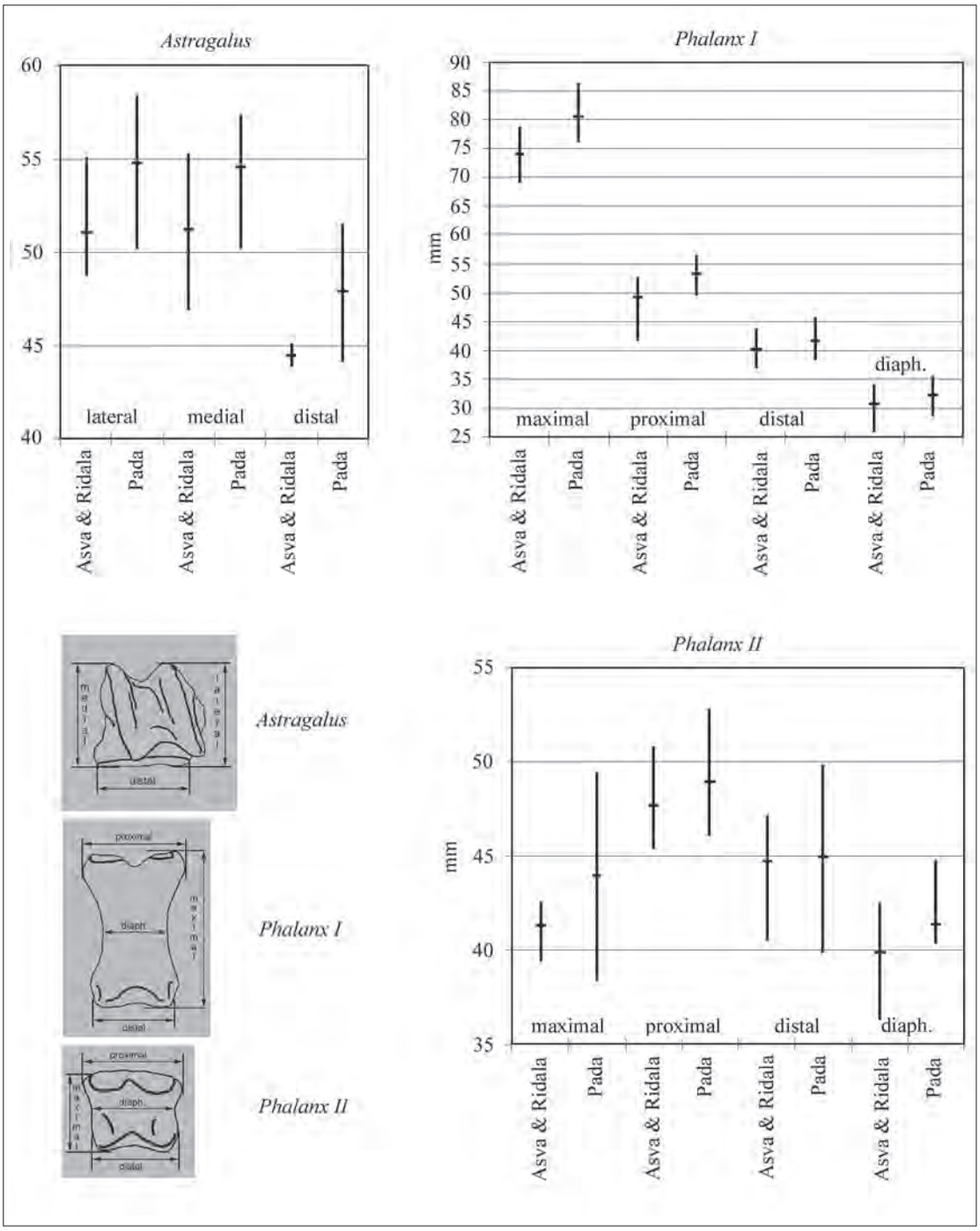

Fig. 5. Measurements of horse astragali and phalanges from Asva and Ridala Late Bronze Age fortified settlements and from Pada Viking Age settlement site (prepared by Maldre).

average of 18%) have been killed (or died) during the first 6 months. On the basis of bones from Ridala it seems that a half of the animals were slaughtered before 3 years of age (the precise slaughter age cannot be determined, evidently it was 1–3 years); in Asva more than ¾ of animals were slaughtered before three years of age. Slaughter age of older animals is more complicated to determine: in Ridala 2 horses have been older than 3 years, 1 over 3.5 and 1 over 4.5 years. In Asva, in addition to the specimens reflected in the figure, one horse has been older than 2 years, 1 older than 3, one about 3.5 years, one adult animal and one specimen's age could not be determined even approximately.

Such age structure indicates that in the Bronze Age horses were bred also for flesh. Differences between slaughter ages of horses and cattle are not big. Since the percentage of horse bones in Asva as well as in Ridala is relatively low, one may assume that horse-flesh did not play an important role in the diet of the people there. On the other hand it must be kept in mind that horse was larger than cattle and consequently pro-

vided more meat. As for colts, they were evidently not slaughtered for food but died (or killed) for some other reason. One cannot find direct answer to the question whether horses were used as draught animals in the Late Bronze Age in the osteological material from Asva and Ridala. From Asva one I phalanx of a horse with small exostoses was found. In Ridala no horse bones with pathologies came to light. Unfortunately there is no material for comparison of slaughter age of horses from the Early Iron Age, but in the Pada settlement dating from the Viking Age only 1/3 of horses were slaughtered during the first three years of life (Fig. 4. 2); several horse bones with pathologies found from Pada also suggest the exploitation of horses as draught animals (Maldre 2007, p.73).

The data for analysing the measurements of horses of Asva and Ridala are unfortunately insufficient owing to the fragmentariness of the material as well as the high percentage of young specimens. From Asva a metacarpal bone of a horse has been found with a length of 19.6 cm. The withers height of this horse might have been 120-128 cm. Bones of such small horses have been found in Estonia also from Iron Age, medieval and even later sites (Maldre 1998, p.216ff). Some astragali and phalanges could also be measured and the maximum, minimum and average values of these measurements are given in figures (Fig. 5). For comparison the measurements of bones found from the Pada settlement were used. It appears that the Bronze Age horses in Saaremaa were on the average smaller than the Viking Age animals in Northwest Estonia. One must certainly keep in mind that the quantity of measurable bones in all these investigated sites is very small and thus the results may be random.

Artefacts connected with the exploitation of horse: cheek-pieces of horse harness

An artefact type related to horse is cheek-pieces of horse harness, made from elk antler. From Estonia seven such specimens are known: three complete and two fragmentary pieces from Asva, one from Iru and one fragment from the stone cist of the grave of Proosa (Fig. 6) (Lõugas 1970, p.113 plate 21.1-3; Deemant 1980, plate IV.1; Lang 1996, plate VIII.2; 2007, fig.48.2,3; Sperling 2006, plates XLVIII.1,2 and LV.1,2; Luik 2007, p.53ff). Some fragments of cheek-pieces have been found also in Latvia, for example Brikuļi, Mūkukalns and Kalnieši (Vasks 1994, p.115 plate VII.19,20; Graudonis 1967, plate XVIII.10); and Lithuania, Petrešiūnai (Grigalavičienė 1995, fig. 100.11). Most of such artefacts are found from fortified settlements and only a few are from graves (e.g. Proosa in Estonia and Kalnie i in Latvia).

Fig. 6. Cheek-pieces of horse harness from Asva (AI 4366: 1644, 122) (photograph by Luik).

In the Bronze Age cheek-pieces were made from both bronze and antler. Discoid and bar cheek-pieces of various shapes, made of antler, are known from many regions already since the Early Bronze Age (e.g. Poland, Hungary, Scandinavia, Ukraine: Bąk 1992; Harding 2000, p.170 fig. 5.3; Choyke *et al*. 2004, p.184 fig. 10; Pankovski 2004; Polidovich 2004, pp.145 ff. figs. 2 and 3; Sitnikov 2004; Kristiansen 2005, p.684 fig.2; Górski and Makarowicz 2007, p.107 fig.8). It has been presumed that in the 1st millennium BC horse was also used for riding, primarily for fast movement in battle (Harding 2000, pp.136, 170). Cheek-pieces found from Estonia suggest that horse was used here for riding in that period, but probably such use range did not have similar importance as in southernmore areas, for example in Ukraine and Central Europe.

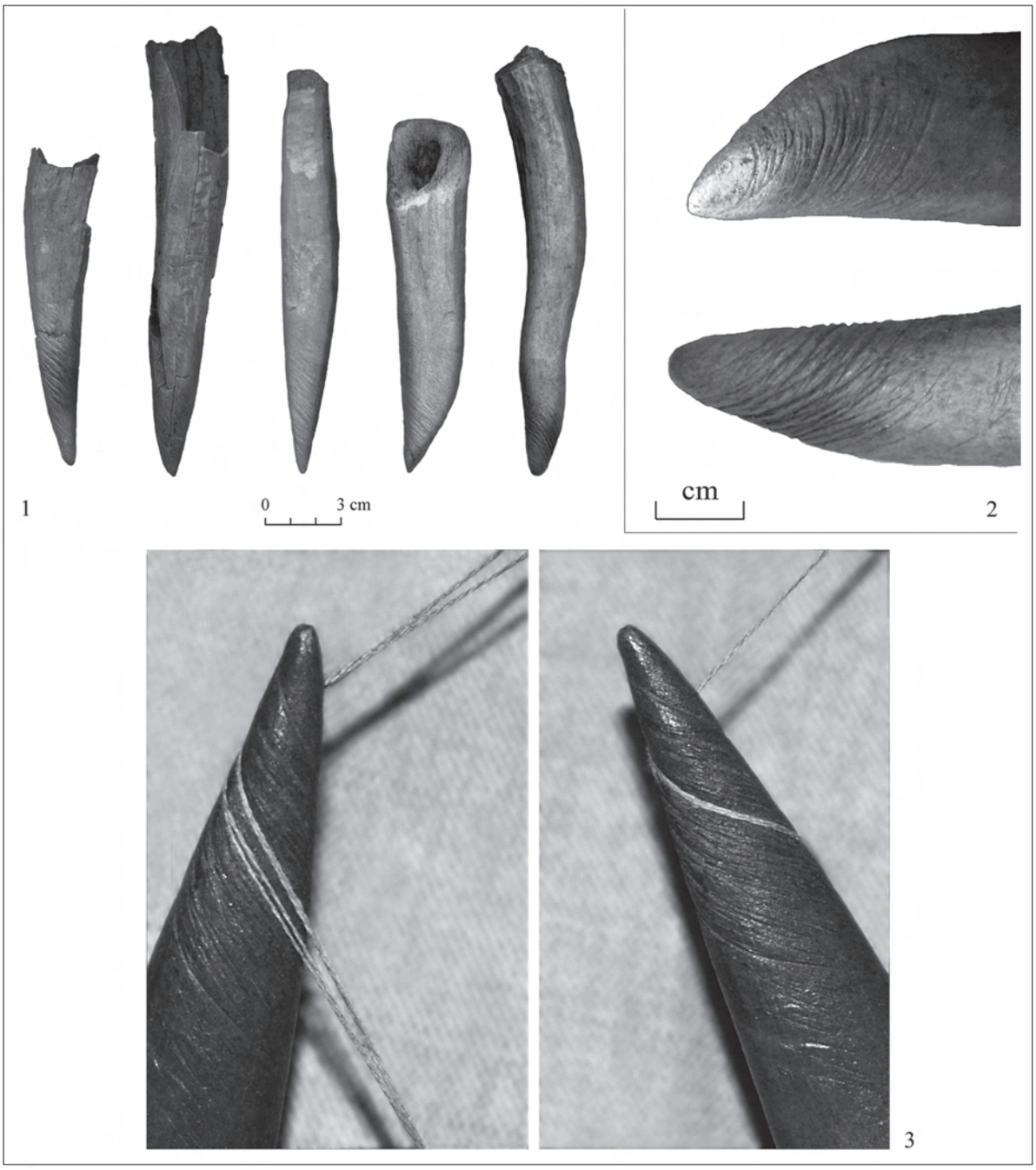

Fig. 7. Antler points with spiral use-wear: 1 points from Asva (AI 4366: 1755, 1163, 1883, 1772, 1823); 2 spiral use-wear on tips of antler points (AI 4366: 1772, 1823); 3 the use of antler artefacts was probably connected with the change of direction of some fibres pulled from somewhere (photographs by Luik).

Antler points with spiral use-wear

An interesting group of finds consist of about ten artefacts made from tine tip or tine, with spiral use-wear at the tip. All these are found from Asva. These points have been made from elk antler (Fig. 7.1,2; Sperling 2006, p.104 plates L.7-10 and LVI.10; Luik forthcoming 2007a, figs. 3-6). The only analogous artefacts known to us at the present come from Smuszewie, Poland, which is a settlement of the Lausitz Culture (ca 1300–500 BC) (Durczewski 1985, plates 50.2; 55.31,32,38; 56.1,8; 59.3,4).

On all points under discussion the spiral traces run in the same direction (Fig. 7.1,2) and these traces seem to be left by some fibres. Since the spiral lines are deeply grooved into the antler surface, they must have been made by some material containing or consisting of strong fibres. Studying the spiral traces on antler artefacts it seems that their use must have been connected with the change of direction of some thread or fibres pulled from somewhere (Fig. 7.3). Probably there must have

been more than one thread or fibre, which in the course of work ran around the tip of the antler artefact – which probably was meant to tauten them – after which these threads or fibres ran together and were twirled into a thicker cord. Probably the use of such tool was necessary to make a cord of even strength and spin as well as to avoid the ravelling of threads. The occurrence of such marked use-wear on the surface of artefacts undoubtedly suggests contacts with strong material as well as their very intensive and prolonged exploitation. Which fibre could it be? One possibility is linen thread, which is obviously strong enough to wear grooves into antler or bone by prolonged motion. As for some antler points bearing particularly fine spiral lines, it seems possible that the fibre worked with them could have been horsehair. For example by a prolonged motion in a fixed direction sometimes even hair has engraved fine lines upon the teeth of antler combs (e.g. comb-shaped pendant from Pada: Luik and Maldre 2005, fig. 21; double simple combs from Otepää and Lehmja: Luik 1998, figs. 30 and 44). Presumably material processed with these antler points was used at making cord or rope, used at seafaring, fishing or seal hunting. Ethnographic record contains information about the use of both linen and horsehair cord for making fishing nets and also for fishing line (Luik forthcoming 2007b).

The use of horse bones for making artefacts

There are not many artefacts, which can be determined as made from horse bones. Naturally one must keep in mind that there are artefacts on which bone cannot be determined to species (e.g. bone pins), it can only be established that they are made from long bones of large herbivores and possible species are cattle and elk as well as horse. But where the material can be determined, it seems that cattle bones were used more frequently for bone working. Cattle bones are also more numerous among unworked faunal remains (e.g. Lõugas 1994, pp.74 ff. table 2; Sperling 2006, p.125ff table 7 fig.38; Lang 2007, p.110 ff. table 1; Maldre 2008a, p.266 ff. tables 1-2 fig.2). All known worked horse bones are metapodials – some of them large middle metacarpal or metatarsal bones, others rudimentary II or IV metapodials (Fig. 8.1).

Artefact type made from horse bones was awls. The rudimentary metapodials of horse are, owing to their shape, particularly suitable for making awls, requiring only slight working. Therefore they have been used for that purpose in many places and at different times. The finds from Asva include more than ten such bones, collected as artefact finds, but most of them are broken at the finer end and so it is not possible to establish whether they have been used as awls or not (about such problem, although in later period, see e.g. Smirnova 1999, p.149ff). The same can be said about a couple of such bones found from Ridala. It is sure only about three points from Asva which bear clear traces of sharpening around their tips (Fig. 8.2-4). Some awls are made from large middle metapodials by splitting. At least three such artefacts, one of them unfinished, were found from Asva (Fig. 8.5-7), and so was the fourth point, with a head quite worn so that it is not quite sure whether it was made from horse bone (Fig. 8.8).

In addition, some worked metapodials are also known. A horse bone with working traces was found by Piotr Wojtal among the faunal remains from Asva in the course of the study. It is a metapodial of a young horse with epiphyses still not ossified (Fig. 8.9). The sides of the bone have been smoothed by cutting. For example skates have been made from limb bones of horses. Both metapodials and radii have been used for this purpose. Bone skates are usually dated to a later period but e.g. in Hungary skates are known dating from the Bronze Age (Choyke *et al.* 2004, p.185 fig.15; Choyke and Schibler 2007, fig.11). It is possible that the bone in question was intended to be made into a skate but one cannot be sure about it. No definite skate is hitherto known among the Bronze Age finds in Estonia. A fragment of a skate was found from Iru (Lang 1996, plate IX.7; Luik 2000, fig.3.5), and also a couple of metapodials with working traces, which may be blanks for skates, but these do not come from the Bronze Age fortified settlement but from the Viking Age settlement layer there.

Another split metapodial bone seems to be working scrap rather than kitchen refuse, but it is not possible to establish which artefact it was intended to be. One more end of a horse metapodial with cutting traces (Fig. 8.10) was found among faunal remains by Piotr Wojtal. The traces may be also connected with flaying. Although flaying traces known from later periods are different (finer and smaller), they may have been different in the Bronze Age, depending on used tools.

Comparing data from Estonian sites with the neighbouring countries we may observe that the finds from Lithuanian fortified settlements that we could study in the collections of the National Museum of Lithuania included only a few worked horse bones, and these, too, were metapodials (Luik and Maldre 2007, p.9ff. fig.40). In the National History Museum of Latvia we had a possibility to study bone awls and points from Ķivutkalns fortified settlement. Points made from horse bones were not numerous there, constituting less than 5% of all points; mostly metapodial bones were used, but some points were made also from horse ulna.

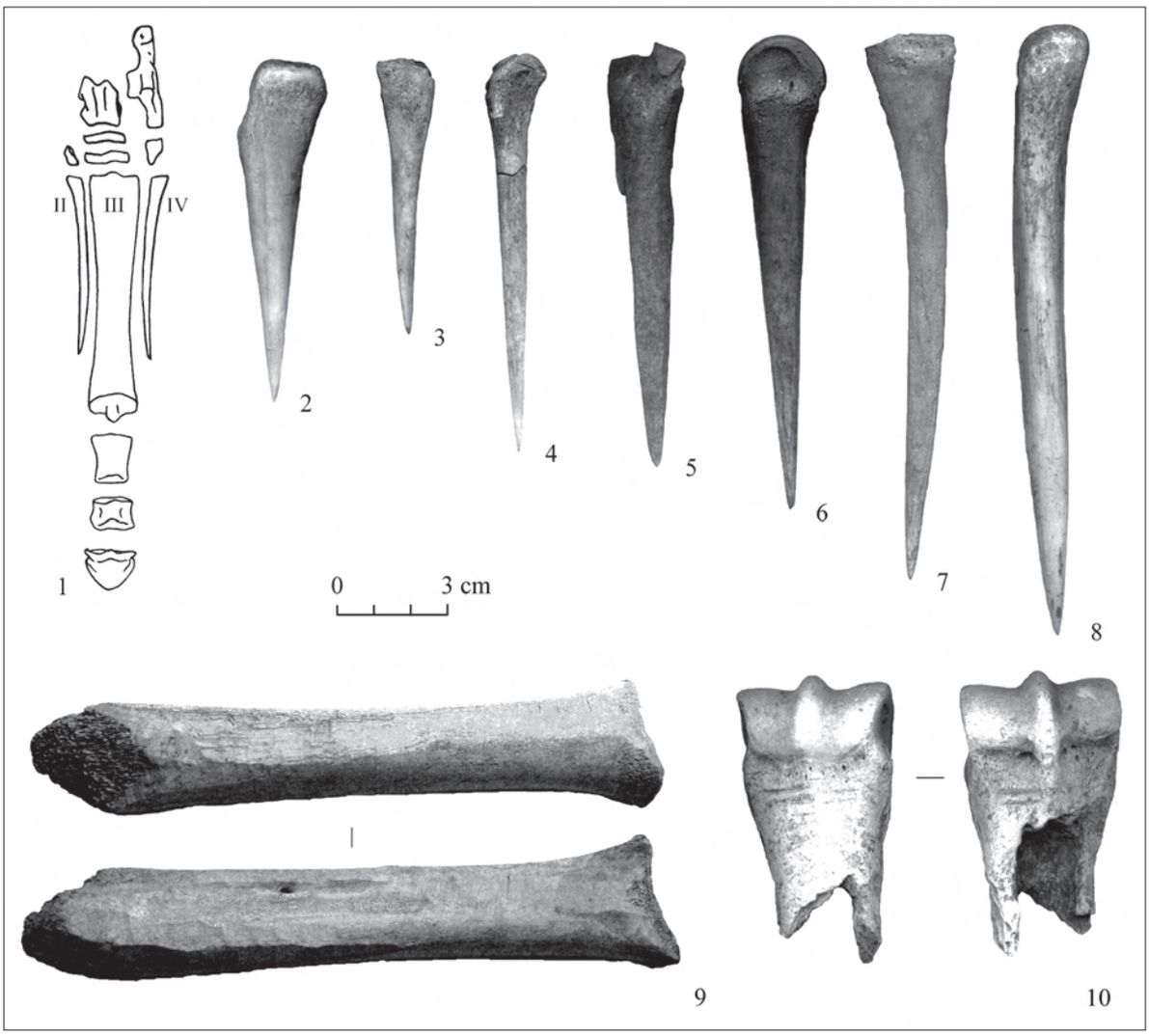

Fig. 8. The use of horse bones for making artefacts: 1 horse autopodium, after Schmid 1972, pl. XXV; 2-4 awls made from horse rudimentary II and IV metapodial bones, (Asva, AI 4366: 691, 3658: 535, 4366: 1804); 5-8 awls from III metapodials (Asva, AI 3658: 450, 3307: 113, 3658: 487, 3994: 1469); 9-10 horse metapodials with working-traces (Asva, without number) (drawing and photographs by Luik).

Summary

What can be said about the exploitation of horse on the basis of finds from Estonian Bronze Age settlements?

Although horse was apparently used as draught animal, the studied material did not confirm it directly. The few cheek-pieces prove that horse was used for riding, although not very widely. The extent of the use of horse for riding depended most likely also on the type of landscape. Horse was also used for flesh. Most likely horse was not essentially a meat animal in Estonia, although it was used as such if necessary.

Besides flesh hide, bones, tendons and horsehair could also serve as raw materials. Of the mentioned materials only bone is usually preserved in archaeological material and its use can be proved. One must admit, however, that horse bones were not a widely used raw material for bone working. It must be mentioned that, concerning determinable finds, mostly metapodial bones were used. About other raw materials acquired from horse only indirect information can be found. For example cutting traces on one of the bones may indicate flaying. Horsehides were undoubtedly used. Awls, which are found in large numbers from the Late Bronze Age settlements (besides horse bones they were also made from bones of other animals: e.g. Sperling 2006, p.104 plates L.1-6 and LVII; Lang 2007, fig.71; Luik forthcoming), also indicate the processing and use of hides. Antler points with spiral use-wear may suggest the use of horsehair.

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Translated by Liis Soon

Abbreviations

AI – Archaeological collections of the Institute of History, Tallinn University

Psalii... – A. N. USACHUK, ed. *Psalii. Elementy upryazhi i konskogo snariazheniia v drevnosti. Sbornik statei. Arkheologicheskii al'manakh*, 15. Donetsk, 2004

References

Manuscripts

LÕUGAS, V., 1970. *Eesti varane metalliaeg (II a.-tuh. Keskpaigast e.m.a. – 1. sajandini m.a.j.)*. Diss. Kand., Tallinn (Manuscript in the Institute of History, Tallinn University).

MALDRE, L., 1997. Saadjärve linnamäelt 1984. a. kogutud arheozooloogilise materjali määramise tulemused (Manuscript in the Institute of History, Tallinn University).

MALDRE, L., 2003a. Aruanne Kaberla asulakohalt 2002. a. kogutud arheozooloogilisest materjalist (Manuscript in the Institute of History, Tallinn University).

MALDRE, L., 2005. Aruanne Uugla asulakohast 2005. aastal kogutud loomaluudest (Manuscript in the Institute of History, Tallinn University).

MALDRE, L., 2006. Aruanne Tornimäelt 2004. a. kogutud loomaluudest (Manuscript in the Institute of History, Tallinn University).

MALDRE, L., 2008b. Aruanne Uugla asulakohast 2006. aastal kogutud loomaluudest (Manuscript in the Institute of History, Tallinn University).

MALDRE, L., unpubl. Asva 1939. aasta loomaluude määramistulemused. (Unpublished manuscript possessed by the author).

PAAVER, K., 1965a. Valjala 1962. a. luumaterjali määramise tulemused (Manuscript in the Institute of History, Tallinn University).

PAAVER, K., 1966. Iru kindlustatud asula ja linnuse kaevamisel 1953.-1957. a. kogutud luumaterjali määramise esialgsed tulemused (Manuscript in the Institute of History, Tallinn University).

PAAVER, K., 1970. Unipiha linnuse 1970. a. luumaterjali määramise esialgsed tulemused (Manuscript in the Institute of History, Tallinn University).

SPERLING, U., 2006. *Die Spätbronze- und früheisenzeitliche Siedlung von Asva in Estland*, MA thesis, Berlin (Manuscript in the Freie Universität Berlin and in the Institute of History, Tallinn University).

Literature

ALLMÄE, R. and MALDRE, L., 2005. Rõsna-Saare I kääbaskalmistu – esialgseid osteoloogilisi andmeid. *Setumaa kogumik. 3 : uurimusi Setumaa loodusest, ajaloost ja folkloristikast = Setumaa symposium. 3 : research into nature, history and folklore of Setumaa = Setumaaski sbornik 3 : issledovania po prirode, istorii i folkloristike Setumaa*. Tallinn: Ajaloo Instituut, 121-137.

ALLMÄE, R., AUN, M. and MALDRE, L., 2007a. Cremations of The Culture of Long Barrows in Northern Setumaa in The Second Half of The First Millenium. Preliminary results. *Humanbiologia Budapestinensis*, 30, 113-122.

ALLMÄE, R., AUN, M. and MALDRE, L., 2007b. Predvaritel'nye rezul'taty izuchenia osteologicheskogo materiala kurgannyh mogil'nikov Rysna-Saare I i II v Severnoi Setumaa (Iugo-Vostochnaia Estonia). *Arheologia i istoria Pskova i Pskovskoi zemli. Seminar imeni akademika V. V. Sedova. Materialy LII zasedania, posviashchennogo pamiati professora A. R. Artem'eva.* Pskov, 298-310.

BĄK, U., 1992. Bronzezeitliche Geweihknebel in Südpolen. *Archäologisches Korrespondenzblatt,* 22: 2, 201-208.

BRADLEY, R., 2005. *Ritual and Domestic Life in Prehistoric Europe.* London; New York: Routledge.

CHOYKE, A.M. and SCHIBLER, J., 2007. Prehistoric bone tools and the archaeozoological perspective: research in Central Europe. *In*: C. GATES ST-PIERRE, R.B. WALKER, eds. *Bones as Tools: Current Methods and Interpretations in Worked Bone Studies. BAR International Series 1622.* Oxford: B.A.R., 51-65.

CHOYKE, A. M., VRETEMARK, M. and STEN, S., 2004. Levels of social identity expressed in the refuse and worked bone from the Middle Bronze Age Százhalombatta-Földvár, Vatya culture, Hungary. In: S. JONES O'DAY, W. VAN NEER, A. ERVYNCK, eds. *Behavior Behind Bones. The Zooarchaeology of Ritual, Religion, Status and Identity. Proceedings of the ICAZ 9th Conference, Durham, August 2002*. Oxford: Oxbow Books, 177-189.

DEEMANT, K., 1980. Ausgrabungen des Steinkistengrabes von Proosa. *Eesti NSV Teaduste Akadeemia Toimetised. Ühiskonnateadused*, 29: 4, 360-361.

DURCZEWSKI, D., 1985. *Gród ludności kultury łużyckiej z okresu halsztackkiego w Smuszewie woj. Pilskie, 1. Biblioteka Fontes Archaeologici Posnanienses,* 6. Poznan.

GÓRSKI, J. and MAKAROWICZ, P., 2007. Reception of Transcarpathian influence in Trzciniec cultural circle as a sign of long-distance exchange contacts. *In*: J. BARON, I. LASAK, eds. *Long Distance Trade in the Bronze Age and Early Iron Age. Studia Archeologiczne,* XL. Wrocław: Wydawnictwo Universytetu Wrocławskiego, 101-116.

GRAUDONIS, J., 1967. *Latviya v epokhu pozdneji bronzy i rannego zheleza. Natschalo pazlozheniya pervobytno-obshinnogo stoya*. Riga: Zinatne.

GRIGALAVIČIENĖ, E., 1995. *Žalvario ir ankstyvasis geležies amžius Lietuvoje.* Vilnius: Mokslo ir enciklopedijų leidykla.

HAAK, A., 2007. Loomaluude leiud keskaegses Viljandis: märkmeid toidulaua ning luu- ja sarvetöötlemise kohta. *Tartu Linnamuuseumi aastaraamat*, 13, 40-53.

HARDING, A.F., 2000. *European Societies in the Bronze Age.* Cambridge: Cambridge University Press.

JAANITS, L., LAUL, S., LÕUGAS, V. AND TÕNISSON, E., 1982. *Eesti esiajalugu*. Tallinn: Eesti Raamat.

KRISTIANSEN, K., 2005. What language did Neolithic pots speak? Colin Renfrew's European farming-language-dispersal model challenged. *Antiquity*, 79(305), 679-691.

LANG, V., 1996. Muistne Rävala. Muistised, kronoloogia ja maaviljelusliku asustuse kujunemine Loode-Eestis, eriti Pirita jõe alamjooksu piirkonnas. *Muinasja teadus*, 4. Tallinn.

LANG, V., 2007. *The Bronze and Early Iron Ages in Estonia*. *Estonian Archaeology*, 3. Tartu: Tartu University Press.

LÕUGAS, L., 1994. Subfossil vertebrate fauna of Asva site, Saaremaa. Mammals. *In*: V. LANG, ed. *Stilus, 5. Eesti Arheoloogiaseltsi Teated*. Tallinn, 71-93.

LÕUGAS, L., KRIISKA, A. AND MALDRE, L., 2007. New dates for the Late Neolithic Corded Ware Culture burials and early husbandry in the East Baltic region. *Archaeofauna*, 16, 21-31.

LUIK, H., 1998. Muinas- ja keskaegsed luukammid Eestis. *Muinasaja teadus*, 6. Tallinn.

LUIK, H., 2000. Luust uisud Eesti arheoloogilises leiumaterjalis. *Eesti Arheoloogia Ajakiri = Journal of Estonian Archaeology*, 4: 2, 129-150.

LUIK, H., 2007. Dazzling white. Bone artefacts in Bronze Age society – some preliminary thoughts from Estonia. *In*: A. MERKEVIČIUS, ed. *Colours of Archaeology. Material Culture and Society. Papers from the second theoretical seminar of the Baltic archaeologists (BASE) held at the University of Vilnius, October 21-22, 2005. Interarchaeologia, 2.* Vilnius–Helsinki–Riga–Tartu, 49-64.

LUIK, H., (forthcoming 2007a). Antler points with spiral use-wear from the Late Bronze Age fortified settlement of Asva in Estonia. *In: Proceedings of the 6th Meeting of WBRG at Nanterre, August 27.-31, 2007.* Nanterre.

LUIK, H., (forthcoming 2007b). Skill, knowledge and memory. How to make a bone awl properly? *In*: *Memory, Society and Material Culture. 3rd Baltic Archaeological Seminar (BASE 3), Oct. 4.-7. 2007, Ventspils. Interarchaeologia, 2.* Riga–Helsinki– Tartu–Vilnius.

LUIK, H. and MALDRE, L., 2005. Bone and antler artefacts from Pada settlement site and cemetery in North Estonia. *In*: H. LUIK, A. M. CHOYKE, C. E. BATEY, L. LÕUGAS, eds. *From Hooves to Horns, from Mollusc to Mammoth. Manufacture and Use of Bone Artefacts from Prehistoric Times to the Present. Proceedings of the 4th Meeting of the ICAZ Worked Bone Research Group at Tallinn, 26th-31st of August 2003. Muinasaja teadus*, 15. Tallinn, 163-176.

LUIK, H. and MALDRE, L., 2007. Bronze Age bone artefacts from Narkūnai, Nevieriškė and Kereliai fortified settlements. Raw materials and manufacturing technology. *Archaeologia Lituana*, 8, 5-39.

MALDRE, L., 1998. Hobune Eestis muinas- ja keskajal. *In*: V. LANG, ed. *Loodus, inimene ja tehnoloogia: interdistsiplinaaarseid uurimusi arheoloogias = Nature, man and technology : interdisciplinary studies in archaeology*. *Muinasaja Teadus*, 5. Tallinn, 203-220.

MALDRE, L., 2003b. Läänemaa kivikalmete arheozooloogiline ained. Appendix 2. *In*: M. MANDEL, *Läänemaa 5.-13. sajandi kalmed. Töid ajaloo alalt, 5.* Tallinn: Eesti Ajaloomuuseum, 263-286.

MALDRE, L., 2007. Faunal remains from the settlement site of Pada. *Eesti Arheoloogia Ajakiri = Estonian Journal of Archaeology*, 11: 1, 59-79.

MALDRE, L., 2008a. Karjakasvatusest Ridala pronksiaja asulas. *In*: L. JAANITS, V. LANG, J. PEETS, eds. *Loodus, inimene ja tehnoloogia, 2, Interdistsiplinaarseid uurimusi arheoloogias. Muinasaja teadus*, 17. Tallinn; Tartu, 263-276.

PAAVER, K. L., 1965b. *Formirovanie teriofauny i izmenchivost' mlekopitaiushchikh Pribaltiki v golotsene*. Tartu: Akademiia Nauk ESSR.

PANKOVSKI, V.B., 2004. Osobyi klass psaliev epokhi bronzy. *In*: *Psalii...*, 115-127.

POLIDOVICH, Iu. B., 2004. Zoomorfno oformlennye psalii kak fenomen skifskoi epokhi. *In*: *Psalii...*, 143-165.

SAKS, P. AND VALK, H., 2002. Loomaluude leiud Viljandi Pähklimäelt. *In*: *Viljandi Muuseumi aastaraamat, 2001*. Viljandi, 52-58.

SCHMID, E., 1972. *Atlas of Animal Bones for Prehistorians, Archaeologists and Quarternary Geologists / Knochenatlas für Prähistoriker, Archäologen und Quartärgeologen.* Amsterdam; London; New York: Elsevier Publishing Company.

SCHMIEDEHELM, M., 1955. *Archeologicheskie pamiatniki perioda razlozheniia rodovogo stroia na severo-vostoke Estonii (V vek do n.e. – V vek n.e.).* Tallin: Estonskoe gosudarstvennoe izdatel'stvo.

SITNIKOV, S.M., 2004. Psalii sargansko-alekseevskoi kul'tury (po materialam lesostepnogo i stepnogo Altaia). *In*: *Psalii...*, 139-142.

SMIRNOVA, L.I., 1999. Prokolki. Khronologiia i funktsional'noe naznachenie. *In*: *Novgorod i Novgorodtskaia zemlia. Materialy nauchnoi konferencii. Novgorod, 26-28 ianvaria 1999. g. Istoriia i arkheologiia, 13.* Novgorod, 142-162.

ULLÉN, I., 1996. Horse and dog in the Swedish Bronze Age. A close-up study of the relation of horse and dog to man in the Bronze Age settlement of Apalle. *Archäologisches Korrespondenzblatt*, 26: 2, 145-166.

VASKS, A., 1994. *Brikuļu nocietinātā apmetne. Lubāna zemiene vēlajā bronzas un dzelzs laikmetā (1000. g. pr. Kr. – 1000. g. pēc Kr.).* Rīga: Preses Nams.

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ARKLYS ESTIJOJE VĖLYVAJAME BRONZOS AMŽIUJE: ARCHEOZOOLOGINIAI IR ARCHEOLOGINIAI DUOMENYS

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Santrauka

Arklys užėmė svarbią vietą bronzos amžiaus visuomenės gyvenime daugelyje Europos vietų. Pabrėžiama jo ritualinė svarba, taip pat jo, kaip turto, susijusio su statusu, reikšmingumas. Šiame straipsnyje pateikiama informacijos apžvalga apie arklius ir jų naudojimą Estijos vėlyvajame bronzos amžiuje. Aptariamasis periodas – vėlyvasis bronzos amžius – Estijoje datuojamas 1100–500 m. pr. Kr.; tai laikotarpis, kai gyvenviečių struktūroje atsiranda pirmosios įtvirtintos gyvenvietės (1 pav.).

Kalbant apie archeologinę medžiagą pateikta trumpa apžvalga apie Estijoje rastus arklių kaulus (2 pav.) ir apie vėlyvojo bronzos amžiaus įtvirtintų gyvenviečių radinius, nuodugniau aptariant radinius iš Asva ir Ridala gyvenviečių Saaremaa saloje (3–5 pav.). Archeologinių radinių analizė aptaria su arkliu susijusius bronzos amžiaus kaulinius radinius dviem aspektais: radinius, susijusius su arklio naudojimu (6–7 pav.), ir radinius, pagamintus iš arklio kaulų (8 pav.).

Ką galima pasakyti apie arklio naudojimą remiantis radiniais iš bronzos amžiaus gyvenviečių? Net jei arklys akivaizdžiai buvo naudojamas kaip traukiamoji jėga, tyrinėta medžiaga to tiesiogiai nepatvirtina. Keletas laužtukų (6 pav.) rodo, kad žirgas buvo naudojamas jojimui, tačiau nelabai plačiai. Arkliai taip pat būdavo naudojami mėsai; greičiausiai arklys nebuvo grynai mėsai skirtas gyvulys Estijoje, nors, kai buvo būtina, arkliena buvo valgoma (3–4 pav.). Kaip žaliava, be mėsos, buvo naudojama arklio oda, kaulai, sausgyslės ir ašutai. Iš minėtų produktų archeologinėje medžiagoje paprastai išlieka tik kaulai, ir jų naudojimą galima patvirtinti. Arklio kaulai nebuvo plačiai naudoti kaip žaliava; reikia pridurti, kad pagal ištirtus radinius naudoti tik ilgieji galūnių kaulai (8 pav.). Apie kitus iš arklio gaunamus produktus galima rasti tik netiesioginę informaciją. Pavyzdžiui, pjovimo žymės ant vieno iš kaulų atsirado nudiriant odą (8: 10 pav.). Arklių odos, be abejo, buvo naudojamos; ylos, kurių daugybė randama vėlyvojo bronzos amžiaus gyvenvietėse, taip pat kalba apie odų apdirbimą ir naudojimą. Raginiai smaigai su spiralinėmis darbo žymėmis (7 pav.) gali rodyti ašutų naudojimą.

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