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LIKE A NEEDLE IN A BONESTACK: OSTEOLOGICAL ANALYSIS OF THE EARLY ROMAN PERIOD CREMATION GRAVES FROM THE AITTAMÄKI CEMETERY IN LIETO, SOUTH-WESTERN FINLAND

Abstract

Osteological analysis of the Roman Period (AD 0–400) burials from the Aittamäki cemetery in Lieto, south-western Finland, indicates that nine individuals were buried in five graves. If the inhumation burials from the site date to the same use phase, then the total number of individuals is at least twelve. Cremation graves 2, 3 and 5 were single burials, while grave 1 was a double burial. Grave 4 was exceptional in that it contained the cremated remains of four individuals, which is more than in any other similar burial from the Roman Period in Finland. Though there were differences in the preservation of bones, all of the individuals had been cremated in a temperature of over 800°C. There were also indicators of a cremation-induced pugilist pose from graves 1 and 4, as indicated by the patterns of burning and the preservation of hand bones. The study of the cremains also brought to light previously undetected artefact fragments, including two iron sewing needles.

Keywords: cremation burials, Finland, Germanic peoples, osteology, Roman Iron Age

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INTRODUCTION

The Aittamäki site is located in the Municipality of Lieto, south-western Finland, on a small hill just south of the River Aura and approximately 100 m north-east from the Vanhalinna hillfort (Fig. 1). The hillfort has been the subject of archaeological investigations from the late 19th century onwards. It is therefore surprising that the cemetery next to it had remained unknown to archaeologists all the way to 1993, when it was discovered during a survey done by archaeology students from the University of Turku (Hautio & Lähdesmäki 1994; Salminen & Lähdesmäki 1994). The site was partially excavated between 1993 and 1995, and these excavations revealed that there were two phases of use separated by a period of discontinuity several centuries long. The younger layer was a Viking Age (AD

800–1050) burial site, a so-called cremation cemetery under level ground. Underneath this – and partially damaged by the younger phase of use – were five cremation pits dated to the Early Roman Period (AD 0–200), three inhumation burials, where the skeletal remains had completely decayed, and a larger stone setting, which was partially exposed but not excavated (Hautio & Lähdesmäki 1994; Hakanpää et al. 1995; Korkeakoski-Väisänen 1996; Sipilä 1996) (Fig. 2).

The cremation pits and inhumation burials from Aittamäki belong to a widely spread Germanic burial tradition, with roots reaching to the Bronze Age Urnfield culture. In Finnish archaeology these graves are collectively known as the Kärsämäki type burial tradition (Salo 1984: 208–9) and they are limited to the southern coastal zone between Laitila and Salo. Tra-

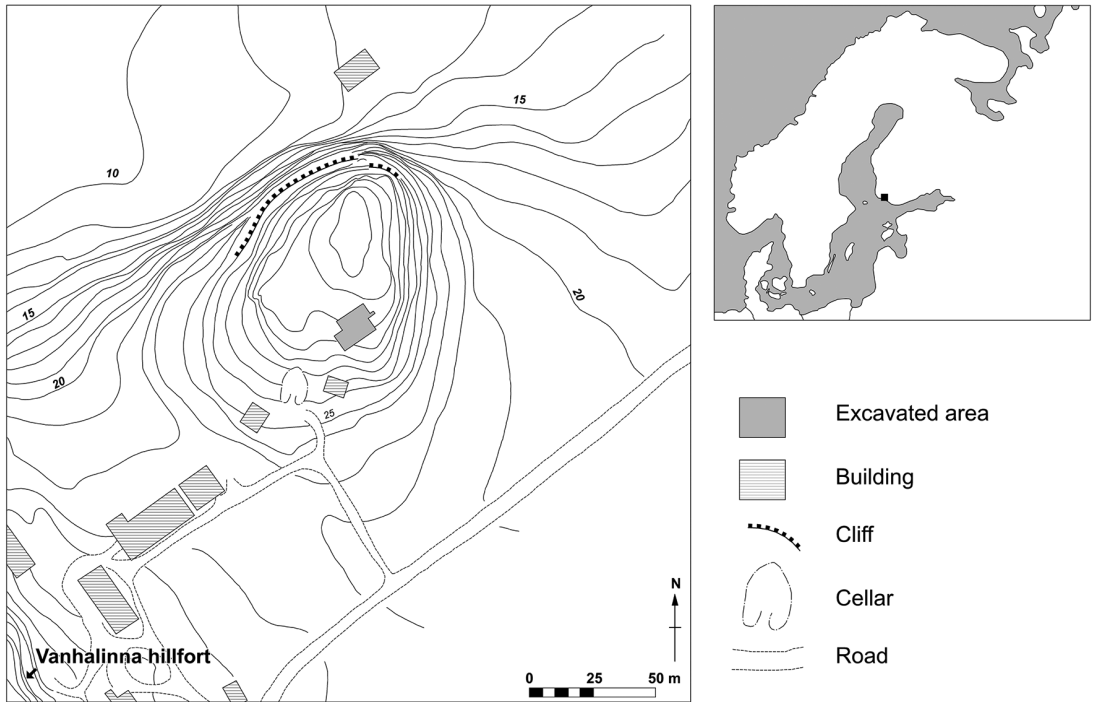


Fig. 1. The location of Aittämäki cemetery next to the Vanhalinna hillfort and museum in Lieto. Map: J. Moisio (after Hakanpää et al. 1995).

ditionally, they have been dated primarily to the Roman Period (AD 0–400), but some sites (e.g. Maaria Kärsämäki) remained in use even during the later phases of the Iron Age (Salo 1968: 48).

The Finnish term for these burials is derived from the site of Maaria Kärsämäki in Turku, one of the largest excavated sites from the Roman Period in Finland. It encompassed between 75 and 93 burials. Most of these were cremation pit burials, but there were at least three identified inhumations and some uncertain graves, where the skeletal remains had not been preserved, probably due to acidic soil conditions (Salo 1968: 48–54). The origin of this burial tradition has been heavily debated among Finnish archaeologists, but nowadays the consensus view seems to be that it represents Germanic immigrants from southern or central Sweden, who settled in the coastal region of Finland Proper during the Early Roman Period and continued to use their distinctive burial forms (e.g. Salo 1984: 9; Raninen 2005: 46; Raninen & Wessman 2015: 237).

The grave goods from the Aittämäki burials have been discussed in earlier publications (see Lähdesmäki 1995; Pälikkö 2009), but the cremations themselves have not been studied by an osteologist before, and therefore new information from the site was hoped to be gained by analysing them. On the whole, osteological analysis has been utilized only in a limited fashion in the study of the Roman Period burials in Finland, but fortunately the focus has been at sites with Kärsämäki type burials, as a result of which there is ample material to compare the results with.

The very first study was done in the 1920s when von Bonsdorf analysed the dental remains of one of the inhumation graves at the Maaria Kärsämäki site (Salmo 1930: 61; Lahtiperä 1973: 2–3). Interest towards the cremation graves grew in the 1970s, when burials from two of the largest Kärsämäki type cemeteries were analyzed (58 burials from the Maaria Kärsämäki site itself, and 10 burials from the site of Sonkila in the Municipality of Laitila) (Lahtiperä

1973; 1974). Following these, a single cremation pit from Soukainen (also in Laitila) and two burials from Meriniitynpuisto in the Municipality of Salo have been analysed (Vormisto 1985: 153–4; Pesonen & Lahti 2005). These studies have mainly focused on traditional forms of osteology, with the effects of cremation on bones and the processes behind them having received little attention. It is, however, important to understand the heat-induced changes on the bones and to analyse the processes of burning to get a more comprehensive picture of past burial practices.

The main aim of this study is the identification of the minimum number of individuals (MNI) in each grave and, if possible, the biological sex and age of these individuals. This might enable the comparison of the results with the previously done studies and find similarities or differences in the burial practices within the Käräsämäki type burial tradition. The sex determination, in particular, is hoped to enable a reanalysis of the previous artefact-based gender determinations of the buried individuals, and to assess the relevance of the results in the wider context of the Käräsämäki burial tradition. Another aspect is the study of the cremation process itself, or to identify the pattern of thermal destruction in human remains and how tissue shielding, such as the pugilist pose, could be discerned from the remaining fragments of bones (see Symes et al. 2008: 23–51, Plates 2–3).

CREMATION AS A PROCESS

In order to understand the changes observed in the cremated bones, it is important to identify the principles behind the burning processes and how combustion affects the bones and tissues. The burnt skeletal material from modern commercial crematories is of limited use in the study of prehistoric cremation practices, as the conditions in cremation ovens are too uniform compared to those of open air funeral pyres (Bohnert et al. 1998: 20; Alunni et al. 2014: 167). A focus on the archaeological, anthropological and forensic studies of cremation seems more fruitful, as these fields have analysed the effects of asymmetric cremation processes extensively, as well as the way in which these are reflected in the patterns of destruction, as seen on the remains of cremation (e.g. Baby 1954; Binford 1963; Van Vark 1974; Symes et al. 2008; Wahl 2008; Alunni et al. 2014). However, it should be noted that there are still disputes in the interpretation of the evidence, as there are very few standards in the recognition of normal burn patterns in bones altered through combustion (Symes et al. 2008: 17).

Fire itself requires that four different categories are met: 1 – combustible fuel; 2 – oxidizer (e.g. oxygen); 3 – energy as a means of ignition (e.g. heat); 4 – the fuel and the oxidizer must interact as a self-sustaining chain reaction (DeHaan 2002: 21; 2008: 1). The structure of the

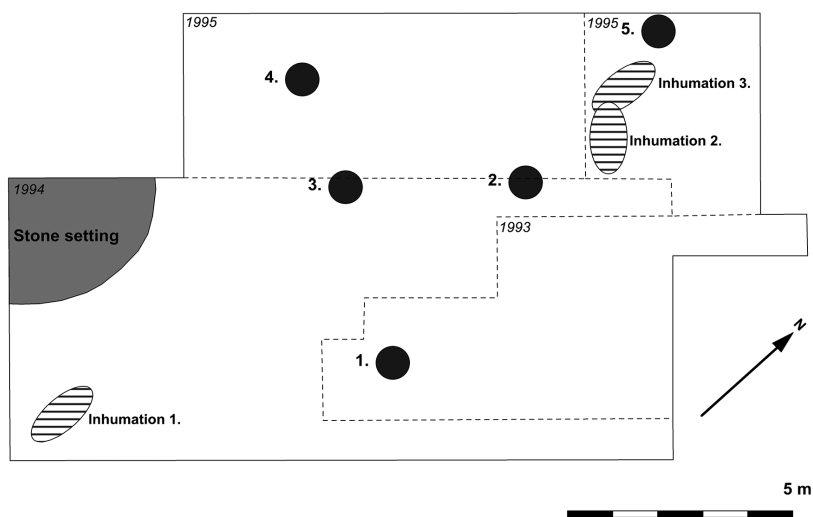


Fig. 2. Map of the excavations showing the partially revealed stone setting and the cremation and inhumation burials at Aittämäki. Map: J. Moisio (after Pälikkö 2009: Fig. 1).

flame changes in relation to its size: a small flame (such as a candle) is nearly always laminar in form, but when the size of the flame grows, its structure starts to break rapidly due to the increased turbulence. Therefore, most of the fires that are witnessed in everyday life have a turbulent structure, and in these the temperature of the flame is in a state of constant flux (DeHaan 2002: 24; 2008: 3).

The maximum measured temperature of a wood fire is a little over 1000°C, but the average temperature just above the fuel source varies between 800–900°C and rapidly decreases towards the tips of the flames, where the temperature is approximately 500°C (DeHaan 2002: Table 4.5; 2008: 5–6, Table 1.3). After the flaming phase of a wood fire has ended, combustion can still partially continue, as charcoal forms through pyrolysis. In this late phase, the flames themselves are usually dying out and the process of burning continues as a glowing fire, where a sufficient convective draft through the ash and coal layer can maintain temperatures that are high enough to melt metals (maximum temperature is 1390°C). This phase can last much longer than the earlier phase of flaming fire (DeHaan 2002: 22, 26, Table 4.5; 2008: Table 1.3).

The effect of high temperature on skeletons is drastic, as heat destroys the collagen of the bones very rapidly and leads to calcination. Other effects include colour changes, shrinking, deformation and fragmentation of the bones (Symes et al. 2008: 23–4, 35–46; Wahl 2008: 147). However, it must be noted that burn patterns caused by heat on bones do not have to be uniform, as body position and tissue shielding can affect the preservation of different bones. Bodies set on scaffolding are usually burned more extensively, as flames can surround most of the body, while obstructions underneath the body can preserve parts of the skeleton or bones in larger fragments and in better condition than expected (DeHaan 2008: 12; McKinley 2008: 167). Other factors that can affect cremations are strong winds which lead to faster but less even burning. On the other hand, heavy rainfall can lower the temperature of the pyre and lead to only partial cremation of the body (McKinley 2008: 168).

Tissue shielding or the pugilist pose, where the muscles of a human body are affected by

heat, causing them to contract, is evident in a large number of cases where the body has been witnessed to move on the pyre. In the region of hands, this contraction leads to a closed fist, which offers the best protection to the distal phalanges, while other parts of the hand, especially the dorsal sides of bones, are more exposed to heat. This can be best seen in the ‘canoe’ dorsal sections of the cortical bones of the hand. In this way the bones or those parts that have the least amount of tissue shielding and longer exposure time to fire are affected more extensively than areas with thicker tissues or protected by a pugilist pose (Fairgrieve 2008: 44–5; Symes et al. 2008: 27, 30–3).

When analysing cremated remains, the usual methods of age and sex determination continue to apply (see White et al. 2012: 379–426), but compared to analysing unburnt skeletons, the information available is much more limited. Alterations in the bones caused by heat can lead to misinterpretations that need to be taken into account. For example, heat can force the separation of cranial sutures and metaphyses of long bones, and this in turn can cause the age estimations appear too young. The destruction of diagnostic bones and features can also make the identification of sex more difficult or even impossible (Wahl 2008: 147–8). Interpretations given by osteological analysis are thus always subject to discussion, even in the case of unburnt skeletons, and their accuracy depends on a large number of variables that must be taken into account (White et al. 2012: 380–1). But in spite of the inherent uncertainties with osteological studies there are often no other alternatives to interpreting burials, as even when grave goods are present, the established gender assumptions may not reflect the actual biological sex of the buried individuals.

MATERIALS

The studied material was composed of the cremated remains from the five burials excavated between 1993 and 1995. The total weight of the bone fragments (after sieving and cleaning) was approximately 5466 g, but a large portion of the bones had been broken into fragments that were too small to be identified. The weight of the analysed bone remains was approximately 2847 g,

with a total of 4701 fragments identified at least on a very general level (the accuracy depending on the presence of diagnostic features).

The comparative materials used in this study consisted of human and animal remains in the osteological collections in the Department of Archaeology at the University of Turku. Archaeological materials included cremated human remains from a Roman Period burial (Soukainen in Laitila) and skeletal remains from two historical period cemeteries (Kolerahautausmaa in Turku and the Tuulos cemetery in Hämeenlinna), which were available at the time. In addition to these, the study was supplemented using the Essential Skeleton 4 software (3D4Medical, 2014, version 4.2).

METHODS

The changes to bone tissue caused by cremation in high temperatures dictated the methods used in this study, because the high level of fragmentation and further thermal alteration limits or even makes it impossible to identify or assess the age, sex, health or stature of the individuals (e.g. White et al. 2012: 379–426). The determination of sex relied heavily on the analysis of the supraorbital margin fragments of the frontal bones, also used along with other cranium fragments to determine the MNI. The aging of the individuals focused on the study of the fusion of cranial sutures, epiphyses of the long bones and sacral vertebrae, but the effects of high temperatures on the bones had to be taken into account in the interpretations. Therefore, the results of the analysis have been derived from a very small number of bone fragments, and most of the identifications were made at a relatively general level, which is a common situation when studying cremated remains (Wahl 2008: 147–52).

In studying the changes caused by the cremation process itself, focus was placed on the analysis of fragmentation patterns and other indicators of thermal alteration, such as colour changes, shrinkage and warping of the bones. In the case of the pugilist pose, interpretations relied mainly on the study of the preservation and destruction patterns visible on the bones of the hand (see Symes et al. 2008; Wahl 2008: Table 9.1). The cremains were also sieved to separate

the sand and pebbles from the bones, following which the remains were reweighted. During this phase the diagnostic bones and some of the more prominent bone fragments were also carefully cleaned of dirt, in order to enable the identification of particular features of interest, such as cranial sutures. It was also during this phase that new artefact fragments were found from among the bones. These artefacts and other finds from the site are discussed towards the end of this paper.

RESULTS

General observations and MNI

A quick observation at the beginning of the analysis showed that most of the cremated bones were still in the same state as when they had been stored up after excavations, and apart from a layer of dirt, most of the fragments were relatively clean. However, in a few cases the fragments were covered with a thick layer of soot. After the separation of sand and soil from the bones, the total weight of the cremated bones in each of the five graves decreased somewhat from those mentioned in the catalogues.

Osteological analysis of the cremated bones made it possible to identify the minimum number of individuals, suggesting that the material contained remains of at least nine different individuals. Graves 2, 3 and 5 were single burials, grave 1 was a double burial and grave 4 held the remains of four different individuals. There was also a cervical vertebrae fragment from outside grave 3, which indicates another individual, but its association with the Roman Period burial is uncertain. It must also be noted that the presence of bones from multiple individuals in the graves could indicate that the same pyre site was used for the cremation of individuals at different times, and that the remains of 'extra' individuals could be the result of intermingling of bones with those not found or collected after earlier cremations. Finally, the osteological analysis showed that all of the identified bones were from humans, as no animal bones were identified in the course of the analysis.

Moving on to interpreting the temperature and duration of the cremation, the analysis

showed that the colouration of the bones in all of the graves was relatively uniform: mainly cream white, but in some of the long bone fragments the colouration on the side of the medullary cavity was light grey or blue in hue. Some bone fragments also exhibited light brown hues. The larger bone fragments showed clear deformation and shrinkage. In most of the bones there were longitudinal, stepped, transverse and curved transverse fractures. Some of the cranial bones also showed clear signs of delamination. The sound from the bones, when struck against each other, resembled that of porcelain or glass, which indicates that they were heavily calcined. From these observations it can be deduced that the individuals had probably been cremated in a temperature of over 800°C long enough for all of the organic components in the bones to have been destroyed, and the heat-induced fragmentation processes had broken most of the bones into small pieces (see Wahl 2008: Table 9.1).

The deformation of the bones and presence of curved transverse fractures indicates that the deceased had not been defleshed before cremation, as these patterns are the result of the shrinking of muscles and periosteum (Curtin 2008: 205; Symes et al. 2008: 43–5). Possible post-cremation burial practices, such as breaking of bones into smaller fragments, is possible, but the inconsistent size of bones in all of the graves makes this unlikely. There was also no apparent selection or preference of bones placed in the grave, suggesting that the cremains had been picked up and buried as they were found from the pyre site.

Tissue shielding

In graves 1 and 4 there were also signs of a possible heat-induced pugilist posture, indicated by the preservation of the bones of the hand. The identified distal phalanges were preserved almost intact, while medial and proximal phalanges were more clearly damaged. This pattern continued to the metacarpals and there was only a single carpal bone (pisiform) from grave 4, while in other graves carpal bones were completely absent. This could indicate that the closure of the hands into a fist was induced by heat and soft tissues offered protection to the distal phalanges. The main caveat with this interpretation is that these were collective cremations, and the better preservation of bones could thus cause a misconception, as bones from two or more individuals could result in more preserved phalanges. However, this does not explain why distal pedal phalanges were not as numerous as distal manual phalanges.

Grave 1

The cremated bones from grave 1 had been buried in an urn which was made of an organic material, probably wood or birch bark. The vessel had decayed completely and only the resin ring, which had been used to caulk the seams of the vessel, had survived. The grave pit had been originally covered with sandstone slabs, but the Viking Age use of the site had probably moved them from their original position (Hautio & Lähdesmäki 1994: 13–4). The burial is one of the most richly furnished cremation pit graves,



Fig. 3. Unfused sacral bone fragments from grave 1. Photo: J. Moisio.

as the grave goods included a neck ring with trumpet-shaped ends, an eye brooch (preußische Nebenserie), a miniature sickle, a knife, a glass bead, a copper alloy finger ring, an arm ring and a few iron tangs or spikes (Lähdesmäki 1995: 80). The brooch and the neck ring can be dated quite accurately: a comparison of these artefacts with materials from related sites (e.g. Rzeszotarska-Nowakiewicz 2010: 324; Godłowski 2011: 71) dates the burial to the latter half of the Early Roman Period, more precisely to the B2a period (AD 70/80–120).

After sieving the cremains, the total weight of the bones was approximately 1825 g. Most of the bones could only be identified only on a general level, but there was also a large number of diagnostic bones that could be analysed. According to maxillae fragments, at least two individuals had been buried in the grave. The fusion of cranial sutures suggests that the first individual was an adult. There were also root fragments from permanent teeth. The second individual was probably a child or a young adolescent, as the fragments from the sacral vertebrae had not yet fused (see Ríos et al. 2014) (Fig. 3). The determination of sex of the adult was based on the supraorbital margin of the frontal bone and this indicates that the individual was a female.

Grave 2

One of the graves was found partially in the section of the excavation area of 1994, and a few bones found during the excavations of the following year were associated with the burial. The cremated remains had been placed in a simple pit with no visible stone or other structures, and the dispersal of some of the bones around the grave could have been caused by tree roots or the disturbances during the use of the Viking Age cremation cemetery (Hakanpää et al. 1995: 5; Korkeakoski-Väisänen 1996: 7). Due to the lack of grave goods, the dating of the grave is uncertain, but it is most likely from the Roman Period.

The total weight of cremated bones from the grave was approximately 300 g, and the excavators collected approximately 120 g of bones from the immediate vicinity of the grave. The association of the bone fragments from around the pit with the burial is possible, but not com-

pletely certain. Most of the bones in and around the grave had been fragmented into such small pieces that they could be given only a rough identification. Based on dentition, there were roots of permanent teeth, and the sutures on the cranial bones showed clear signs of fusion. From the latter, it can be estimated that the individual was an adult. There was also a supraorbital fragment from the left side of the frontal bone, but comparing it with those from other graves puts it in the category of intermediate, and thus the sex identification even at this level remains uncertain.

Grave 3

The second burial to be found in the section of the excavation area of 1994 was grave 3. It had been covered with a small structure composed of cobblestones. At the bottom of the grave pit, remains of resin from an urn were found. It has been suspected that the grave had been damaged at a later date, as some bones were found from outside the grave during the next year's excavations (Hakanpää et al. 1995: 5; Korkeakoski-Väisänen 1996: 7). The burial itself did not feature any grave goods, but two artefacts were found next to the grave: a spearhead with a clearly raised midrib (Fig. 4) and a knife with a curved back (Hakanpää et al. 1995: 8). Similar spearheads (type 18) in Scandinavia are dated from the latter half of the Early Roman Period to the first half of the Late Roman Period (B2–C1b) (Ilkjær 1990: 128–9) and if Pälkkö's (2009: 89) assertion is right, these artefacts were originally placed within the grave and could thus be used to date the burial.

Approximately 554 g of bones were found from the grave pit and 36 g were collected near the burial. The association of the bones from outside the grave with the burial is uncertain, as their colour differs from the ones found from others, but this could be the result of different procedures that were followed in their post-excavation cleaning. Among the bones was also a single piece from a cervical vertebra that seems to have belonged to a child, but it is not certain if it had originally been in the grave. The grave itself contained cranial fragments where the fusion of sutures had begun, indicating that the buried individual was an adult. The sex of this



Fig. 4. Spearhead with a clearly raised midrib found next to grave 3 and dating from the latter half of the Early Roman Period to the beginning of the Late Roman Period. Photo: J. Moisio.

individual could not be identified as no diagnostic bones were present among the cremains. The grave also contained two roots from permanent teeth.

Grave 4

The fourth burial was found during the excavations of 1995 and there were some uncertainties concerning the stone structures around the grave. It seems that there were two circles composed of stones surrounding the burial, while the pit itself had been covered with a sandstone slab. Given the shape of the bone assemblage and the round discolouration at the bottom of the pit, the cremains had most likely been placed in an urn (Korkeakoski-Väisänen 1996: 7, 10; Pälikkö 2009: 89). The grave goods included two copper alloy arm rings, an antler comb, a fragment of an artefact made of antler or bone, and an iron fragment. A sickle was found next to the grave, and it is possible that later disturbances had moved it from its original position. The burial has been dated to the Early Roman Period, and the arm ring with profiled ends defines it to the latter half of the period (B2) (Salo 1968: 110; Pälikkö 2009: 89–90).

After sieving the total weight of the bone fragments was approximately 2260 g. Compared to the other burials, the preservation of diagnostic bones was good, and there were supraorbital margin and maxillae fragments from three different individuals. The fourth individual was a child, identified based on an atlas fragment. The burial contained a large number of roots from permanent teeth and also cranial fragments from

adult individual(s), as there were pieces where the sutures had fused. The sex identification relied on the analysis of the frontal bone fragments, which included one supraorbital margin that can be described as masculine and two that can be described as feminine. The feminine traits on the supraorbital margins could indicate female individuals, but they could as well be from adolescent male individuals whose craniums had not yet developed characteristic traits of an adult.

Grave 5

The cremated remains in the other burial excavated in 1995 were originally in a small urn, which had been placed in the grave upside-down and had decayed completely. The only remaining parts were from a rectangular resin ring at the top of the burial (Sipilä 1996: 6–7). The shape of the urn was previously unknown in Finland, as other resin rings from vessels of this type are either round or oval in shape, although there is one burial from Maaria Käsämäki where the shape of the bone assemblage could indicate similarly shaped urn (Salmo 1930: 57; Salo 1968: 178–80; Lähdesmäki 1995: 77, 79; Pälikkö 2009: 93–4). In Sweden the situation seems to be similar and rectangular resin rings appear only as a rare exception. The closest parallels to the grave are known from cemeteries in central Sweden, such as Barkarby, Bastubacken and Åbygravfältet (Holmqvist 1956: 11–2, 41; Äijä 1985: 128; Svanberg 1996: 153). Aside from the urn, the grave contained no grave goods, but the radiocarbon dating of the resin dates it from the

very end of the Pre-Roman Period to the Early Roman Period (1946±34 BP; UA-43367; i.e. 5 calBC – calAD 130 [92.7%]; calibrated using the software OxCal 3.10). The grave pit itself had been lined with upright sandstone slabs and covered with another (Sipilä 1996: 6–7; Pälkkö 2009: 90).

The total weight of the cremated bones was approximately 370 g, but there were only a few diagnostic bones that could be used to analyse the buried individual. From the dentition there were root fragments of permanent teeth, from the frontal bone there was a piece of supraorbital margin and from the mandible there was a larger fragment of ascending ramus. The comparison of the mandible fragment with an adult one indicates that the remains belonged to a young adolescent, whose growth had not yet ended. The supraorbital margin was very delicate and feminine, but the determination of sex was not possible due to the young age of the individual.

Other finds

Most of the grave goods were discovered during the excavations and, as mentioned in the beginning of this article, have been published previously. However, during the osteological analysis some previously undetected fragments of artefacts, which probably belong to some of the earlier finds, were discovered, and two completely

new finds were made. Grave 1 included small fragments of resin, two small pieces of copper alloy wire (probably related to the brooch), and a broken sewing needle made of iron. Among the bones from grave 4 were a small quartz flake, a short segment from an arm ring and another piece of an iron sewing needle (Fig. 5).

Small artefact fragments were expected to be found as similar observations have been made before (e.g. Lahtiperä 1973), but the finding of well-preserved needles came as a surprise. Previously, only one similar sewing needle made from copper alloy had been discovered from an Early Roman Period burial (grave 28 at Maaria Käsämäki) (Salo 1968: 39, Taf. 17:8). A second needle has been found at the Late Roman Period site of Storsvedsberget in the Municipality of Karjaa (Keskitalo 1979: 205, XXIV:127).

DISCUSSION

Osteological analysis of the remains from the five graves indicates that there were at least nine individuals buried at the excavated parts of the Aittämäki burial site. Two of the graves were multiple individual burials, as grave 1 contained the remains of two individuals and grave 4 contained four. If the three inhumation graves are taken into account, then the MNI from the first phase of use of the site rises to twelve. However, it must be taken into account that the site (including the stone setting) has been only partially excavated, and more burials may thus be found in the future.

The analysis of the sex of the individuals shows that both men and women were buried at the same site, but due to the lack of diagnostic bones in some of the graves, the identification of sex was not possible. The age range was identified on a general level and the presence of bones from a child and adolescents shows that there was no discrimination or separation of individuals based on age. The lack of animal bones in the graves is in line with results from other small Käsämäki type cemeteries, but contrasts with finds from the Maaria Käsämäki site itself, where bones from large numbers of animals of different species have been identified (see Lahtiperä 1973).

The effects of cremation between different graves were relatively uniform. The fracture



Fig. 5. Fragments of iron sewing needles from graves 1 (left) and 4 (right). Photo: J. Moisio.

patterns, fragment size, colour, deformation and heavy calcination indicate almost complete combustion of the deceased in a temperature of over 800°C. This was seen even in the case of multiple individual burials, but in such cases it is possible that separate cremation pyres were used for each individual. The differences in the preservation of the bones and their amount between graves could be attributed to the cremations themselves, always affected by a wide range of changing factors. The study of the bones of the hand showed signs of tissue shielding in the form of a pugilist pose in at least two graves (1 and 4). The preservation of individual bones and burn patterns followed a classic example of the pose, where the distal manual phalanges are better than the other bones of the hand (see Symes et al. 2008: 30–3, Plates 2–3).

CONCLUSIONS

In trying to understand cremated human remains, it is essential to understand that the circumstances in every open pyre cremation are unique, and readers should note that in this study varying stages of destruction of bones were witnessed between the graves. Tissue shielding or structural elements of pyres could explain why some of the bones were preserved better than others, but one must also take into account the human element after the cremation, as some of the bone fragments could have been missed or scooped from earlier cremations. However, there were also clearly unifying factors in all of the graves and these are connected to high temperatures and long duration of the cremation. The bones were all calcinated and there were no signs of partial cremation even in the multiple individual burials.

The multiple individual burials from the Aittämäki site in the context of the Käsämäki burial tradition indicate that this type of burial was not uncommon during the Roman Period, and the traditional understanding of these burials as graves for single individuals is misleading. The Sonkkila site in Laitila featured four double burials, and the Meriniitynpuisto site in Salo included one grave with remains of two individuals and another one with three individuals. The Maaria Käsämäki cemetery is the largest site of this type in Finland. Out of the 58 analysed

burials, three contained remains of two and one contained remains of three individuals (Lahtiperä 1973: 52; 1974: 47; Pesonen & Lahti 2005: 80). However, it must be emphasized that there could be more graves at Aittämäki – as well as at the other Roman Period sites in Finland. Most of the sites have been excavated only partially and almost all of them have also been damaged by recent land use, which may have destroyed large portions of the graves. Another factor is the cremation process itself, as diagnostic bones could have been destroyed by fire, and the minimum number of individuals (MNI) identified in later osteological analyses could thus be lower than the number actually buried at the site.

The lack of animal bones from the graves at Aittämäki is consistent with the findings from Sonkkila, but differs from those of Maaria Käsämäki, where animal remains from different marine and terrestrial species have been identified (Lahtiperä 1973: 46–7; 1974). The analysis also showed that both sexes and all age groups were buried at the site, which is somewhat different from the Sonkkila site, where the burials have been interpreted as male dominant (with only one identified female in a site with 20 burials) (Lahtiperä 1974: 49). In this respect the Aittämäki site is closer to the Maaria Käsämäki cemetery, where both men and women were buried at the same site (Lahtiperä 1973), but it must be noted that future excavations could alter this interpretation.

In the wider thematic context of gender studies, the combination of osteological and artefact-based sex determination of individuals can be used to test or reanalyse previous interpretations. The sex/gender of the adult individual in grave 1 is in line with the earlier artefact-based assumptions, but remarkably the grave, given its wealth when compared to the other Käsämäki type graves, could also represent the burial of a high-status woman. This contrasts with Salo's (e.g. 1984: 223) view that women held a subordinate position within the society, which he thought was reflected in the lack of grave goods and in the location of women's burials in cemeteries.

Similar richly equipped women's graves from the latter half of the Early Roman Period, interpreted by some as burials of the high rank-

ing women (Reisborg 1994: 61), are also known from the Mälaren region in Sweden. However, this interpretation has been heavily criticized and instead it has been suggested that the richly furnished women's graves do not represent high social status or wealth of the individuals, but are related to a larger social struggle of the period (Andersson 1998: 86–8). From this perspective women are seen as pawns in the competition between the old and new elites, and their burials simply reflect one aspect of extravagant spending to show the wealth and influence of the group.

The main flaw with both Andersson's (1998) and Salo's (1984) views is that they are androcentric in their assumption that there is no such thing as female agency. They explain richly equipped burials and weapon graves of males as representing men who were active individuals in their society who had the ability to raise their social standing through their own merits, but at the same time women are seen as a homogenous group that only served the needs of the society without any influence or will of their own (e.g. Andersson 1998: 87). This simplification of gender roles ignores the individuality of both genders. In order to construct a more comprehensive picture of the past, men and women should be treated on equal terms.

One way to accomplish this comes through the study of personal ornamentation, such as arm rings, in the graves of men. Earlier interpretations suggested that men buried in the Käsämäki type cemeteries did not use jewellery (Salo 1984: 212–3), but osteological evidence shows this to be a false assumption. For example, grave 70 from the Maaria Käsämäki site was originally assumed to be a woman's burial because an arm ring was found among the remains, but osteological analysis showed that the individual was a man (Lahtiperä 1973: 49). A similar example is found at a Late Roman Period burial from the Ala-Junnola cemetery in Sauvo, which included woodworking tools, an axe and a spearhead. These have been associated with a male individual, but the burial also included female regalia in the form of jewellery, such as neck and arm rings (Keskitalo 1979: 43). The burial has not been analysed by an osteologist, but it raises questions on the gender identity of the individual – or, alternatively, the possibility that

there was more than one individual in the grave. The arm rings from grave 4 at Aittamäki may similarly represent a male adornment, but in this case it is not possible to identify which of the four individuals owned or used them.

The examples above are limited in number and there are uncertainties with their interpretation, but they still manage to paint a much more diverse picture of the Käsämäki type burial tradition. The use of jewellery could indicate that the men buried in the Käsämäki type cemeteries were more closely linked with local traditions than previously assumed, as arm rings have been found from men's graves in cemeteries that follow completely different burial forms and traditions (Salo 1984: 212–3).

Finally, the newly discovered Roman Period sewing needles from Aittamäki find parallels in Scandinavia, where they have been primarily associated with leatherworking. The Scandinavian needles have been found in assemblages that have included awls and leatherworking knives (Hagberg 1967: 115–6, Figs. 46, 50; Gustafson 2016: 50–3), in Finland often been interpreted as razors (e.g. Salo 1968: 158; 1984: 211–2; Ranninen 2005: 54). However, a closer comparison with modern leatherworking tools has shown that many of these were most likely used to work with hides and leathers. Another compelling fact is that in Scandinavia similar items have also been found in graves of women, who probably had no need to shave (Ekholm 1939: 28; Hagberg 1967: 115–9; Räf 2001; Gustafson 2016: 53–5).

Grave 28 at Maaria Käsämäki could thus be interpreted as a leatherworker's burial, as there was also a small curved knife in the grave. The nature of the two graves (1 and 4) from Aittamäki is more difficult to interpret, as none of the other artefacts can be confidently associated with the leatherworking trade. Possible leatherworking tools from grave 1 include the straight-edged knife and two narrow iron tangs or spikes, which could be awls. From grave 4 there was also a long piece of iron, which could be an awl (Pälkkö 2009: 89).

The scarcity of sewing-needle finds from Finland could be attributed to the destruction caused by corrosion, but the two finds from Aittamäki showed relatively good preservation due to cremation. Therefore, it is likely that small

artefacts, such as needles, could still be found from among the cremated remains that are presently stored in museum collections, but have not yet been analysed by an osteologist. In addition to the present study, this has been evidenced in the study of the Maaria Kärsmäki site, where previously undetected artefacts and fragments of artefacts were identified in the course of the analysis (Lahtiperä 1973).

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