Investigations at Sõjamäe and Soodevahe cup-marked boulders and Late Neolithic / Iron Age settlement site at the south-eastern border of Tallinn

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INTRODUCTION

The four cup-marked boulders (numbers 2616, 2617, 2618, 2619 in the National Registry of Cultural Monuments; Fig. 1), situated at Sõjamäe and Soodevahe, at the border of Tallinn town and Harju county, were investigated due to the planned Rail Baltic railway route (Kriiska et al. 2015a; see also Lang et al., this volume). Around one of the boulders, a Corded Ware and Iron Age settlement site was discovered. The railway corridor will be situated 40–190 metres from the monuments.

The cup-marked boulders have been under state protection since the 1970s. However, based on the records of the National Heritage Board of Estonia, three of them (nos. 2617–2619) have since been moved from their original locations. The boulders are a part of a larger, rather sparsely distributed group in the southern part of Lasnamäe district of Tallinn. The group of 14 cup-marked boulders currently under heritage protection is spread within a 1.5 km radius (7 km²), with Rae bog being its southern limit. With most of these boulders discovered by amateur archaeologist Oskar Raudmets in the 1960s and 1970s, many have since been moved from their original locations and at least some have been destroyed, including at least one in the vicinity of the boulders investigated here (Raudmets 1965; 1966). Thus, the group is probably delineated as such due to the preservation of these specific boulders in an area of active settlement, not necessarily reflecting their initial distribution.
Of other types of archaeological sites in the immediate vicinity of the research area, only two settlement sites on the northern edge of Rae bog were previously known. The first is located ca. 1 km south of the boulders and dated to the Early Iron Age (reg. no. 2610; Kimber et al. 2015). The second is a probable Iron Age settlement in Rae Parish (reg. no. 18870), ca. 1 km south-east of the investigated area.

The research area is situated approximately 40 m a.s.l. on a flat limestone plateau characteristic of northern Estonia. The alvar grasslands of Sõjamäe and Soodevahe were used as pastures by the inhabitants of Tallinn as late as in the 1920s (Raudmets 1966). Currently, the whole southern part of Lasnamäe district is an industrial region, with the area investigated being the property of AS Eesti Raudtee. The boulders are located on mostly open grassland with some shrubs and trees.

**CUP-MARKED BOULDERS NOS. 2617–2619**

The choice of methodology for the investigation of cup-marked boulders was based on the consideration that some archaeological features known around other cup-marked boulders are virtually undetectable by simple test-pitting (e.g. standalone fireplaces such as in Kurna, Harju county, and Peterburi Road 99 in Lasnamäe; Kimber et al. in prep.; Lõugas 1981, 390) or their character and dimensions are difficult to estimate (e.g. stone settings such as in Patika; Toos & Mäll 2000). The methods of preliminary investigations around the boulders consisted of four stages designed to collect data about the presence and distribution of possible archaeological remains.

Firstly, the boulders and their surroundings were cleared of vegetation. Secondly, the landscape within a radius of a couple of hundred metres was surveyed for earlier soil works and variations in relief and vegetation. Thirdly, around each boulder, in their respective protection zones of 50 m, shovel-wide test pits were dug at ca. 10 m interval. Lastly, the surroundings of each boulder within a 10 m radius were excavated with a backhoe to the depth depending on the results of test-pitting. The boulders’ surroundings within the radius of 15 m were surveyed with a metal detector. Soil samples for phosphate analyses were collected from the test-pits, as well as from the excavated areas.

Boulders nos. 2617 and 2618 are situated between the present railway tracks (so-called factory railway) in the south and Betooni põik street in the north (Fig. 1). They were surrounded by thick brush and construction rubble. Boulder no. 2618 had been turned upside down, so none of the cup-marks were visible. As the debris was removed with a backhoe, the large scale of soil work done at the location became evident. Boulder no. 2617 was initially located directly next to the railway tracks. Some time after 1975, it had been moved ca. 20 m northward to its current location. While reaching 1 m above ground in the beginning of the fieldwork and measuring 4 × 2.2 m, its actual height was revealed to be approximately 2.2 m (Fig. 2). To move the boulder northward from the tracks, the topsoil in its path had first been completely removed, exposing the bedrock. The boulder was dragged on iron beams which were left in place, as was the wire rope tied around it. Some time afterwards, the surroundings had been filled with construction debris, lifting the ground surface by 1–1.5 m. Boulder no. 2618 was pushed on top of it. Unmixed topsoil (original ground surface) was preserved some 10 m north and north-west from the boulders, underneath the fill layer. Dark and peaty, it had the characteristics of excessive moisture. A grain of bog ore was found from this layer, but no archaeological remains. As the ground has also been lifted and levelled
south of the railway tracks, the original surface is likely preserved only locally, under the fill layers.

In the 1975 description of boulder no. 2617, there were 47 cup-marks noted on its topside. Now, altogether 72 cup-marks were counted (4–11 cm in diameter, depth 0.5–5 cm). With the slanted southern, railway-facing side of the boulder possibly intentionally broken during construction, the number of cup-marks may have been even larger. As boulder no. 2618 was turned around with the backhoe, four cup-marks (5 cm in diameter, depth 1 cm) were counted on its surface. The measurements of the boulder are 2.2 × 2.3 × 0.8 m.

Boulder no. 2619 is located ca. 145 m south-east of boulders nos. 2617–2618 (Fig. 1), on a flat meadow. The boulder, measuring 1.7 × 1.3 × 1.2 m, is situated 1.5 m north of a chain-wire fence restricting access to actively used Tallinn–Tapa–St Petersburg/Tartu railway tracks. According to the description of the boulder from 1975, it was then situated 7–8 m southward, directly at the railway tracks. Having been moved due to railway construction and erecting of the fence, the boulder had been turned upside down and the possible cup-mark on it was not visible.

The area within a 10 m radius of the boulder has been levelled with a layer containing debris from the second half of the 20th century (plastic, railway sleepers, industrial slag). Generally, the debris was located in the upper 20–40 cm. Locally, the original surface had been removed until the moraine layer. From one test-pit on the eastern side of the boulder, a small potsherd (TÜ 2545: 1) was found in addition to recent debris. The unornamented sherd is mineral-tempered and dated to the Iron Age. There were no other archaeological remains found. To complete the survey, the boulder was turned face upwards, with one cup-mark (5 cm in diameter, depth 1 cm) found on its surface.

BOULDER NO. 2616 AND SOODEVAHE SETTLEMENT SITE

Boulder no. 2616 is located just outside the border of Tallinn (Fig. 1), on a meadow between Betooni põik street and the so-called factory railway. The meadow is bordered by excessively moist, brushy areas in the north and north-east, with the original topsoil disturbed in its northern and western part (Fig. 3). Locally, the soil has been removed and pushed into heaps, exposing the bedrock.

The boulder measures 2 × 2.7 m, with the height of 1.2 m. In addition to the five cup-marks described in the documentation from 1975, two certain and three probable cup-marks were discovered on the boulder. At least one cup-mark was discovered on a small boulder (0.3 × 0.4 × 0.5 m) on its south-side. However, it could not be determined if the small boulder was in its initial location – it was set in the upper soil layer, on top of weathered bedrock, while boulder no. 2616 lay directly on the limestone bottom.

¹ Fieldwork was not possible in the fenced area.
As test-pitting resulted in archaeological finds, the radius of the investigation area was expanded to 100 m and only the turf layer was removed with the backhoe (Fig. 3). For excavation and documentation purposes, the area was designed as an isogonal octagon of $425 \text{ m}^2$ and divided into $1 \times 1 \text{ m}$ squares. Each of these were divided into four squares of $0.5 \times 0.5 \text{ m}$.

Digging was done in two layers, following the natural soil profile of limestone rendzina, with the dark greyish-brown upper layer (10–15 cm) of organic-rich sandy loam very poor in stones, and the lower layer (3–10 cm) containing sometimes more, sometimes less disintegrated limestone. Since the upper layer contained modern finds in several test-pits around the boulder, and as there was no visually distinguishable cultural layer, the excavation plot was dug with shovels. The soil was sieved using a $5 \times 5 \text{ mm}$ mesh and the finds were collected from each square of $0.5 \times 0.5 \text{ m}$ (Fig. 4).

Based on the finds, the site turned out to be a Corded Ware settlement, preserved on approximately $2400 \text{ m}^2$ and reaching ca. 30 m around the boulder (Fig. 3). The settlement probably extended up to 15 m farther to the north and west, to the areas where the topsoil has been previously removed. In the east, the settlement bordered with an excessively wet area. Thin limestone rendzina, upon which the site lies, continues farther southwards, but without any archaeological finds. The southern border of the settlement is located 190 m from the railway corridor.
As the soil profile was characteristic of limestone rendzina, the site has evidently not been mixed by deep ploughing. The lack of visually distinguishable cultural layer may result from it being thin and indistinguishable in the first place, and/or possibly mixed due to early cultivation which only disturbed the upper soil layer. The fragmentation and dispersion of the material due to soil disturbances is indicated by the fact that in the northern part of the excavation plot, there were 5–15 cm deep irregular natural pits in the limestone bedrock which contained relatively large pieces of pottery. Based on 19th – 20th-century maps, neither the settlement territory nor nearby areas were used as fields in Modern Times. Later mixing of the soil was nevertheless indicated by modern finds from all over the excavation plot, from both the upper and lower layer (Fig. 6).

No distinct structures or features were encountered in the excavation plot. Burned rocks were sparsely distributed over the area. One discernible feature, although undatable, was a dark and cloggy patch on the southern side of the boulder. The dished-bottom patch was distinguishable already after removing the turf and it reached all the way to the limestone, with 23 cm as its maximum thickness.

**FINDS FROM SOODEVAHE SETTLEMENT SITE**

The find material consists overwhelmingly of pottery sherds, as is common in Corded Ware sites (Kriiska 2000, 64 and the references therein). Altogether, 2750 sherds were found, with 2692 (97.8%) belonging to the Corded Ware (Fig. 7) and 58 (2.2%) to the Iron Age (Fig. 9: 1). Additionally, there were some finds of stone (quartz and flint flakes, pebbles, etc.), as well as some much later material. Apart from the Iron Age ceramics (and possibly Iron Age slag), there are very few artefacts from other prehistoric periods. The amount of material with question-able dates is small, comprising mostly animal bones and some flint fragments (see below).

Pottery was found from all over the excavation plot, from both the upper (2.1 kg) and the lower layer (0.3 kg). There were no distinctly empty areas, but the plot’s western and south-western parts contained less pottery (Fig. 5). The immediate vicinity of the boulder was not discernible based on the amount of finds. Two areas with more pottery could be distinguished: one in the northern and the other in the south-eastern part of the plot. This applies to both Corded Ware, as well as Iron Age pottery finds. Notably, the south-western part of the plot with few pottery sherds was rich in modern material (Fig. 6). It is likely that the concentration areas do not indicate prehistoric intra-site differences, but rather differences in later disturbances on the site.

Among Corded Ware pottery, both the fine and the coarse type are represented. Most of the sherds originate from coarse, thick-walled and flat-bottomed pots (Fig. 7: 1–2, 4–7). The fine,
thin-walled beakers comprise 4.8% of all sherds (Fig. 7: 3). The vessels are predominantly made of clay tempered with organic fibrous admixtures (crushed plant remains; 92.7% of all sherds). Combinations of organic and mineral tempers are far less common: rock debris was noted as an addition to organic admixture in 4.6%, grog in 2.3%, and a combination of all three in 0.4% of the sherds. The beakers are occasionally mineral-tempered (in addition to organics), with the amount of temper being generally low and some beakers consisting of almost pure clay (e.g. TÜ 2536: 1100).

The vessels have been made in the coiling technique, with N-type conjunctions (on 71 sherds) and wall thickness of 3–12 mm (determinable on 455 sherds). The bottom thickness could only be measured on two of the ten bottom sherds, being 8–9 mm. The outer surfaces of the vessels are in most cases smoothed (on 98% of the 452 sherds with both surfaces preserved), with striations being more common on the inside (86%; Fig. 7: 1 and 4). Pots often have fibre impressions on them (Fig. 7: 1, 4 and 5). The rims of the pots are predominantly thicker on the sides, forming a protruding border on the outward surface, with some rims being as thick as the walls (e.g. TÜ 2536: 702) or some widening both in- and outwards (e.g. TÜ 2536: 1987). There is also one bottom-sherd with a protruding transition toward the wall. The 44 rim sherds belong to at least 21 different vessels, with some represented by more than one sherd. Among the assemblage, two pots, 30–35 cm in diameter, could be identified. The bottom sherds originate from eight vessels.
The pots have been decorated with cord-impressions, notches, pits and grooves, located mostly at the neck and rim. Cord-impressions (Fig. 7: 1, 5–7) are the most common decorative element, being present on 1% of all sherds (18 wall and 8 rim sherds). The maximum number of cord-impression rows on one sherd is 5 or 6, with 1–3 rows being common. Other decoration types are represented only on a few pot sherds (horizontal grooves on 15 – Fig. 7: 2, notches on 7, incisions on 2, pits on 2 and a protruding ridge on 1 sherd). Beaker sherds have smoothed surfaces and are mostly undecorated, except for two sherds with the so-called spruce-twig motif (Fig. 7: 3) and one with cord-impressions.

Finds of non-ceramic material were not numerous. Quartz finds comprise 22 flakes (Fig. 8: 2–8), chipped pieces and cores (Fig. 8: 1), 16 of which have been made using the bipolar chipping technique (Fig. 8: 1–8). Of the nine flint finds, six or seven can be connected with the Corded Ware complex: besides one scraper (Fig. 8: 11), the rest are flakes (Fig. 8: 9–10, 12).

There are more than 70 Corded Ware settlements and 19 burial sites known in Estonia. Soodevahe settlement site, which is one of the Corded Ware sites in Estonia excavated on a large scale, is the only one located around a cup-marked boulder. Soodevahe is no exception to the general tendency that traces of Corded Ware settlements are in most cases mixed with finds from other periods or intermingled by ploughing (Kriiska & Tvauri 2002, 76). However, later activities on the site have not been very intensive, as the amount of Iron Age pottery sherds is small and they are sparsely distributed.
The closest known Corded Ware settlements are located only approximately 3–4 km from Soodevahe, in Mõigu, Iru and Lagedi. Several of the Corded Ware settlements in northern Estonia were located on the Klint plateau (Võerdla and Rebala; Lang et al. 2001) or the edge of the Klint (Kadrina Võhma I, Ilumäe II and IV; Lang 1996, fig. 101, 120, 398; Lang & Konsa 1998; Ots et al. 2003). Soodevahe settlement lies about 3.5 km from the Klint edge on calcareous rendzina. This settlement pattern, suitable for Stone Age slash-and-burn agriculture and pastures, is seen to indicate that agriculture and pastoralism were the main determinants in the choice of habitation location, also an important means of subsistence (e.g. Kriiska 2000, 72; see also Lõugas et al. 2007) and have been associated with the first landnam, the first farming settlement in the area (Lang 2000, 75ff.; 2003, 132ff.).

The find material is very similar to other Corded Ware settlements in the eastern Baltic, with a general scarcity of non-ceramic finds. The characteristics of Soodevahe pottery – organic admixtures in clay, fibre-impressions on the surface, the shape of the vessels – associate it closely with the idiosyncratic Corded Ware cultural area that has been distinguished in Estonia, northern Latvia, Ingria and Karelian Isthmus (Russia) and south-eastern Finland (Kriiska et al. 2015b, 45).

Iron Age activities on the site are indicated by the presence of 58 potsherds. Most originate from the vessel walls, with only six rim pieces (Fig. 9: 1). Iron Age pottery from the site is clearly distinguishable from the Corded Ware ceramics by its rock debris content, which is more prevalent in the moulding mass and contains a higher amount of mica. Only one sherd contains organic admixture in addition to rock debris. The rims were as thick as the walls, or slightly thinner. The wall thickness could be determined for 13 pieces, being 4–7 mm.
All these sherds were smoothed on both sides, with no other type of surface finish present. The only decorations were notches on the edge of one rim piece. Different rim sherds, as well as a sherd from the wall of a fine ware vessel (TÜ 2536: 940), indicate at least four different vessels among the material. In addition to pottery, half of a Frisian silver coin, minted by count Egbert II after the year 1068, was found east of the boulder (Fig. 9: 3). The appearance of such coins in Estonian deposits has been associated with the short-term upturn in Frisian trade activity in the third quarter of the 11th century, a process which lasted for 20–30 years (Mauri Kiudsoo, pers. comm.).

There was also a rather small but diverse selection of later material. A clay pipe fragment probably from the 18th century (TÜ 2536: 631), a 19th – 20th-century pendant with the image of Virgin Mary (TÜ 2536: 1033), a gun flint (Fig. 9: 4) and a fire-striking stone (TÜ 2536: 139), fragments of a slate pencil and slab (TÜ 2536: 1180–1181), as well as a tinned brass bell with the raised text “ЗАВОДА Ф ВЕДЕНЕЕВА 1891” (Fig. 9: 2) testify later activities on the site.

Osteological material from the site comprised 110 bone and 38 tooth finds, with a total weight of 0.4 kg. Among this extremely fragmented assemblage, only 39% of the remains could be identified to species or subfamily, to which the wide extent of burned bones (46%) contributed as well. Cattle (Bos taurus) was represented by 50 finds, but these were mostly tooth fragments (37), originating from few recently fragmented (e.g. during fieldwork) teeth of subadult/adult individuals. Based on cattle teeth, there were at least four individuals among the material – three calves and one adult. Pigs (Sus scrofa domesticus) were represented by five finds, belonging to at least two individuals: a piglet (possibly new-born) and an adult. Two bones originated from sheep (Ovis aries) or goat (Capra hircus). Of the five bones of unidentified bird(s), the majority likely belong to one individual and seem to derive from relatively recent processes. Among the unidentifiable material, mostly medium-sized and large mammals were recognised. Later mixing of the soil makes it impossible to associate the animal bone finds with any specific time period. The only AMS-dated bone, a sheep/goat vertebra, gave the result of 1690–1926 cal. AD (95.4%).

CONCLUSIONS

During the investigations at Sõjamäe and Soodevahe cup-marked boulders, it was confirmed that three of the boulders (nos. 2617–2619) have been moved from their original locations. There were no archaeological remains around boulders nos. 2617–2618, but additional
cup-marks were discovered on boulder no. 2617, increasing the number to 72 cup-marks. The surroundings of boulder no. 2619 were mixed with construction debris, but yielded one sherd of Iron Age pottery.

Boulder no. 2616 was confirmed to be in its original location. On the boulder, two more cup-marks were found in addition to the five previously known, and one cup-mark was discovered on a small boulder directly next to it. This is the first known instance of two cup-marked boulders this close to each other, but it is not certain if the small one was in its initial location. Surrounding the boulders, a Corded Ware and Iron Age settlement site – named Soodevahe after the historical village nearby – was discovered. The site is preserved within 30 m of the boulders, with its northern edge destroyed during soil works. The initial size of the settlement site was approximately 0.25 ha. The southern end of the settlement site is located 190 m from the planned Rail Baltic railway corridor.

As the only known Corded Ware settlement surrounding a cup-marked boulder, Soodevahe site belongs to a small group of settlements located on limestone rendzina, with some analogues in northern Estonia (e.g. Võerdla, Rebala, Kadrina Võhma I, Ilumäe II and IV). As the environmental conditions are suitable for early slash-and-burn agriculture and pastures, the choice in settlement location evidently indicates that agriculture and pastoralism were the main determinants in the choice of the habitation location. The find material consists mainly of Corded Ware pottery, similar to that in the distinct Corded Ware cultural area in Europe.

Additionally, a modest amount of Iron Age pottery sherds was found. Pottery distribution indicated two concentration areas, coinciding for both Corded Ware and Iron Age. Later disturbances on the site make it unlikely that these reflect Neolithic or Iron Age intra-site differences. Among the extremely fragmented faunal remains, all specimens that were possible to identify were domesticates (cattle, pig and sheep/goat).

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UURINGUD SÕJAMÄE JA SOODEVAHE LOHKIVIDE ÜMBRUSES JA HILISNEOLIITILISE / RAUAAEGSEL ASULAKOHAL TALLINNA KAGUPIIRIL

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Uuringud Tallinnas Lasnamäel Sõjamäe tööstusrajoonis ja Harjumaal ajaloolise Soodevahe küla alal paiknevate lohukivide (kultuurimälestiste registri nr 2616–2619) ümber toimusid Rail Balticu raudteekoridori kavandamise tõttu. Tasasel paepalasel heinamaal asuvad lohukivid jäävad trassist 40–190 m kaugusele (jn 1). Kividest nr 2617–2619 u 50 m raadiuses ning kivist nr 2616 u 100 m raadiuses kaevati prooviaugud, et saada ülevaade arheoloogilise materjali olemasolust ning pinnase iseloomust. Seejärel avati kopplaaduriga igast kivist 10 m raadiuses kaevand surfimise tulemustest lähtunud sügavuseni.

Lohukivi nr 2617 on veetud algsetest asukohadest u 25 m põhja poole. Elenevalt on pinnas kivi teelt paepõhjani ära kooritud. Pärast kivi paika lohistamist on kivi ümbruse täitekiihiga üle 1,5 m tõstetud ning täitekihi peale on lükatud kivi nr 2618 (jn 2). Lohukivi nr 2619 on algsest asukohast u 7 m põhja poole liigutatud. Kivist vähemalt 10 m raadiuses on algse maapinna peale lükatud tasanduskiht 20. sajandi teise poole leidud. Kohati on selleks varasem maapind moreenini ära kooritud. Kivi idaküljel paiknenud prooviaugust leiti lisaks tänapäevasele prahile ka üks ornamentiromandita rauaaegne savinõukil, mille koostises on rohkelt kivipurdu.
