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THE RINGFORT BY THE SEA: ARCHAEOLOGICAL GEOPHYSICAL PROSPECTION AND EXCAVATIONS AT SANDBY BORG (ÖLAND)

The narrow Baltic island of Öland off the east coast of mainland Sweden is famous for its ringforts dating from about AD 200-700 (fig. 1). They are especially notable for the dense settlement remains within their perimeter walls, which set them apart from most other contemporary ringforts and hillforts in Scandinavia. The best-preserved ringfort is Ismantorp, where about 95 limestone foundations for houses are still visible inside a high wall (Andrén 2006; 2014). The best-known ringfort, however, is Eketorp, which was completely excavated in 1964-1974 (Borg/Näsman/Wegraeus 1976). This ringfort contains some 53 house foundations. Several forts, e. g. Eketorp, Gråborg, Bårby and Triberga (all on Öland), show evidence of a second settlement phase dating to the late 12th/early 13th century (Borg 1998, 62; Stein-Borg/Borg/Näsman 2005, 15).

Of the 18 ringforts known from maps and historical records, 15 are still visible in various states of preservation (Fallgren 2008). They differ considerably in size, however, as there are a few small ringforts of around 60 m in diameter, a middle group with a diameter of 60-100 m and a group of large ringforts with a diameter of over 100 m, the largest being the irregularly shaped Gråborg, measuring between 160 and 210 m across.

The ringforts are usually round or oval in shape, except for Bårby, which is a semi-circle located at a steep limestone cliff, and Treby, which consists of three small circles built together in a row. Apart from Ismantorp and Eketorp, dense settlement is visible or known from trial excavations, aerial photos or antiquarian sources in another five ringforts, one of which is Sandby borg. Three gates in the ring wall seem to be the normal pattern whenever it is possible to discern the gates in the ruined walls, but Ismantorp, for instance, has nine gates.

Alongside the forts, Öland is also known for its well-preserved traces of ordinary agrarian settlement from the same period (200-700). Almost 2000 limestone foundations for houses have been preserved or are known to archaeologists (Stenberger 1933; Fallgren 1998; 2006). The ruins are in many cases still surrounded by abandoned fields, meadows and cattle paths, all bordered by stone fences. The stone foundations correspond to perhaps 1400 farms, situated in large, loosely organised villages. These settlement remains allow us to conclude that the ringforts were located on the outfields between the villages and the cultivated land (Fallgren 2008). Normally situated 1 or 2 km away from the contemporary settlements, the forts were nevertheless clearly related to these places, since the main gates in many forts were directly facing the closest village (Andrén 2014, 83). The fact that they were built between several settlements may also have meant that the initiative to build a fort came from several villages at once.

Apart from this collective aspect, the more specific function of the ringforts is still subject to dispute. They have been regarded as places of refuge in times of war (Stenberger 1925; 1933), as fortified villages (Borg/Näsman/Wegraeus 1976) or as locations for organising war and warriors (Andrén 2006; 2014). Although they had a very similar layout, their function probably varied from one fort to another and with time. One example is Ismantorp, which has no cultural deposits and very few finds, indicating that the site

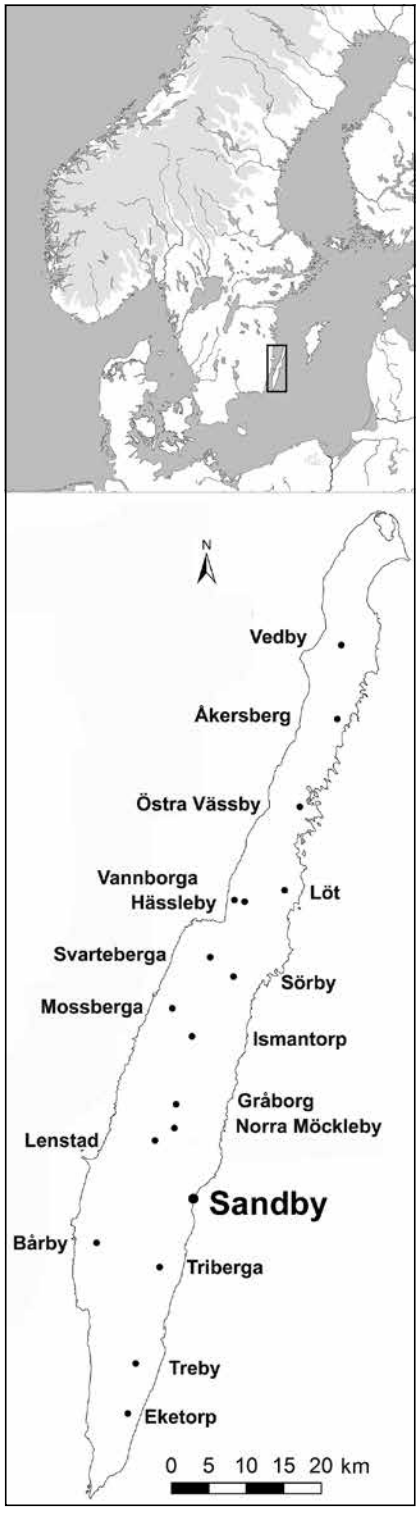

Fig. 1 Map of the island of Öland on the east coast of Sweden and the location of its ringforts. – (Map A. Viberg).

was used sporadically from the 3rd to the 7th centuries. Another example is Eketorp, which was rebuilt and extended considerably around 400, after which it was settled more permanently until about 650, resulting in distinct cultural deposits and many objects and animal bones left at the site.

Possible models for the ringforts have been discussed for a long time, and a number of hypotheses have been put forward. In the light of the earliest dates for the forts it has been natural to turn to the Roman or late Roman world (Stenberger 1933; Werner 1949; Herschend 1985; Näsman 1989; Andrén 2006), but the question of more specific Roman models has been disputed. The issue is whether the ringforts should be regarded as local copies of Roman forms, such as late Roman fortified arenas, settlements and strongholds (Werner 1949; Coulon/Golvin 2011) or as hybrid interpretations of more general Roman principles, such as the Roman planned forts or legionary fortresses (Andrén 2006; 2014).

SANDBY BORG RINGFORT

Sandby borg (RAÄ 45:1) is situated in the parish of Sandby on the east coast of Öland (**fig. 1**). The quaternary deposits in the area are dominated by outcrops of outwash gravels overlying a very shallow limestone bedrock. The fort is oval in shape with an inner area of roughly 95 m × 64 m (approx. 5140 m^2), as measured from exposed parts of the original dry masonry of the ring wall. The thickness of the original wall was 4 m in the north-western part of the fort. The area inside the outer perimeter of the ring wall is today divided into two parts by a modern stone boundary wall, erected between 1822 and 1933 (**fig. 2**).

The fort is located only 40-45 m from the present-day shoreline, at c. 3-4 m above sea level, but the shoreline during the Roman Iron Age, c. 2000 years ago, was approx. 2 m higher (Isostatic uplift map, Swedish Geological Survey) and thus the outer perimeter of the ring wall was situated very close to the prehistoric shore. Outside the north-western part of the ringfort is a low fortification arch consisting of four to five parallel rows of large stones and boulders marking the fort's outer line of landward defence (**fig. 2**). Previous archaeological inventories in the area have indicated that the ringfort had two gates, one in the south-eastern part and one in the north (Sjöborg 1822, 126; Stenberger 1933, 225; Swedish Registry of Ancient Monuments [FMIS] inventory 1976-07-31). Having carried out fieldwork in the area in 2001, Anders Andrén suggested that there may have been a third gate in the north-west, with an estimated width of between 3 and 5 m.

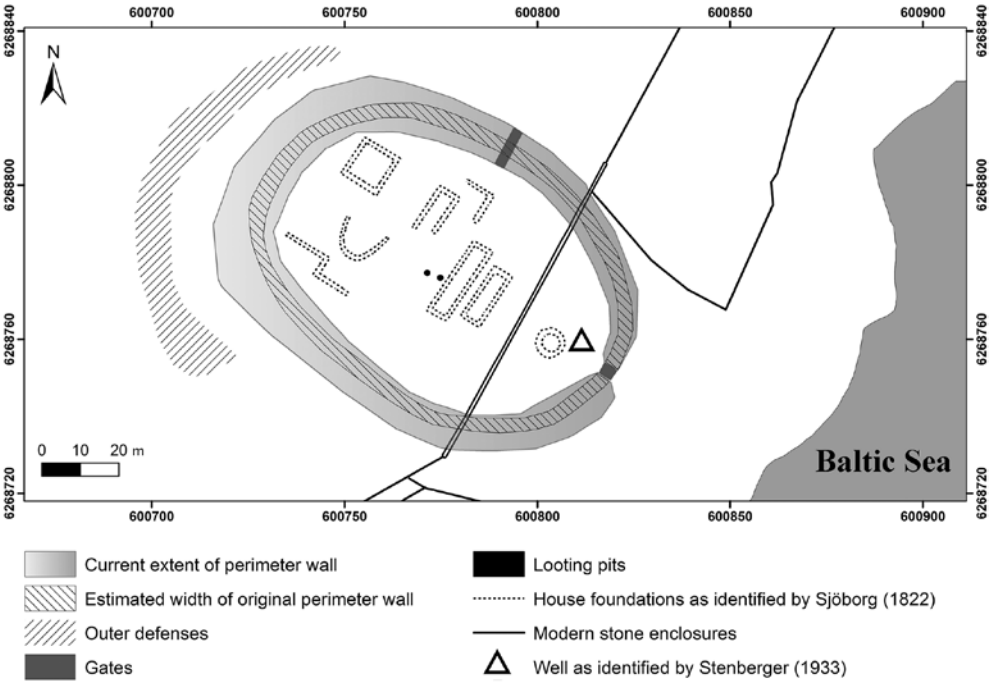

Fig. 2 Spatial layout of Sandby borg and observations made prior to the geophysical surveys and excavations in 2010/2011. – Note that the extent of the perimeter walls and the location of the gates are based on plans published by Stenberger (1933); coordinates in Sweref99 TM. – (Illustration A. Viberg).

Fig. 3 Aerial photo of Sandby borg showing the presence of buried house foundations. – (Photo B. Walther; published by permission of the Eketorp investigation, U. Näsman).

The presence of stone foundations within the fort has been noted by several authors (e. g. Sjöborg 1822, 126; Ahlqvist 1979, 126; Hilfeling 1994), but these foundations are no longer visible. The presence of preserved stone foundations beneath the soil can nevertheless be corroborated by aerial photos from the 1970s (e. g. Wegraeus 1976, 37; Blomkvist 1979, 82; Edgren/Herschend 1995; fig. 3), which have also been used to estimate the number of houses within the fort at around 54 (e. g. Wegraeus 1976, 37; Fallgren 2008, 123). However, the aerial photos do not provide a detailed view of the fort's spatial layout and, as a consequence, geophysical prospection surveys, using ground-penetrating radar (GPR) and magnetometry was judged to be an interesting alternative to more traditional archaeological survey techniques.

Purpose and aims

To obtain a more detailed understanding of the spatial layout of the interior part of Sandby borg and to search for features indicative of burning, such as hearths and kilns, and also pits within the fort, a GPR and a magnetometer survey were carried out in 2010 and 2011, in the course of which traces of several looting pits were found inside the fort. This was reported to the Kalmar County Board and a metal detector survey was conducted in 2010, followed by archaeological excavations in April 2011 which aimed at testing some of the hypotheses put forward for Sandby borg as well as testing the validity of the geophysical survey results. Our primary focus was to date the activities that took place at the fort and to suggest its possible function. We also wanted to investigate whether it could be determined if Sandby borg had multiple settlement phases and if geophysical survey methods could provide a context to the finds collected during the metal detection survey carried out in 2010.

Methods

Geophysical surveys have been used regularly during past decades for investigating prehistoric and historic fortified sites (e. g. Aitken/Tite 1962; Musson 1968; Kvamme 2008; Fassbinder 2010), and excellent results have been achieved, for example, at a ringfort site similar to the Sandby borg fort on the island of Föhr (North Frisian Islands/D; Stümpel/Erkul 2009). In Sweden, where the use of archaeological geophysical surveys has been limited (Viberg/Trinks/Lidén 2011), only two surveys have been carried out inside the forts on Öland, namely Ismantorp and Gråborg, but the quality of the data and the interpretations of the results from Gråborg have recently been strongly questioned and debated (Danielsson 2007; 2012; Trinks/Biwall 2011).

We combined GPR and magnetometry surveys with studies of existing aerial photos of the fort. The complete magnetometer results are presented in the publication by Andreas Viberg (2012), but the interpretations are included in this paper (cf. **figs 6-7**). The GPR survey was carried out using an X3M system, manufactured by MALÅ Geoscience, and a 500 MHz antenna, collecting inline data measurements every 0.03 m along transects located 0.25 m apart. The processing and filtering of the GPR data was conducted by Dean Goodman using the GPR-SLICE computer software (for detailed descriptions of the geophysical methods see, for example, Conyers 2013 and Aspinall/Gaffney/Schmidt 2008).

The availability of clear oblique aerial photos (**fig. 3**) was a valuable asset during the interpretation of the geophysical results, primarily for the house foundations in the northernmost part of the smaller investigation area, where the GPR results were difficult to interpret.

RESULTS AND INTERPRETATION OF GEOPHYSICAL DATA

References to specific houses, discussed in the text below, are presented in the geophysical interpretation image (**fig. 4**). The GPR results reveal 36 or 37 stone foundations for houses placed radially around the wall of the fort (**fig. 5**) together with a central group of 16 or 17 houses, one of which, no. 53 in **figures 4-5**, is separated from the rest, marking the south-eastern end of the central building group. This house measures roughly 14-16 m in length, but its width cannot be estimated as its north-western part is covered by the modern wall. The GPR data are somewhat unclear with regard to the house foundations 15-17, where only

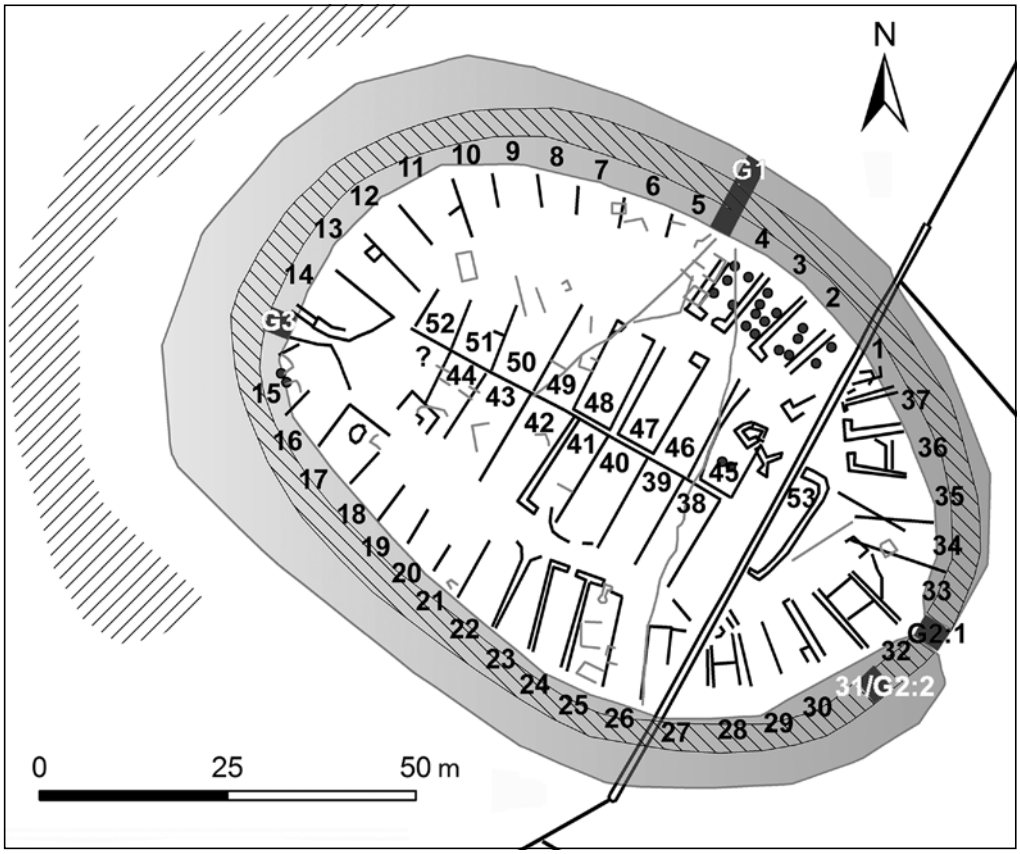

Fig. 4 Sandby borg. Archaeological interpretation of the GPR data. – Black polylines (1-53) = buried walls; light grey polylines = other linear features; circles = possible postholes; dark grey polygons (G1-G3) = gates. – (Illustration A. Viberg).

weak reflections were detected by the instrument. The interpretation of this area must therefore be regarded with caution. The total number of house foundations identifiable on the basis of the geophysical data is 52-54.

The average length of all the measurable houses in the inner and outer groups is c. 13 m, and the average width c. 5 m. The lengths were measured from the estimated ruined remains of the original perimeter wall and are therefore somewhat uncertain, as this wall is in a fragmentary state. Furthermore, many of the houses cannot be measured exactly as their state of preservation, and thus also the strength of the returning radar reflections, can differ considerably from one part to another inside the fort. Some areas producing very strong radar reflections could be affected by the presence of extensive demolition layers, for example, obscuring possible features below (see for example houses 34 and 52 in **figs 4-5**). The strong reflections in the smaller survey area are probably caused by the very shallow bedrock (**fig. 5**).

The houses in the central group are similar in length to the houses along the wall, but wider. In some cases where the house walls are poorly preserved, it is only possible to measure the width of the houses at certain points, often near the present limit of the demolished outer perimeter of the ring wall. The central building group seems to have been rebuilt in the course of time, as two of the house walls are too close to be part of the same building (between houses 40 and 41; **figs 4-5**). These walls are depicted as one in **figure 4**, however. The same discrepancy is visible between houses 1 and 37 (**figs 4-5**).

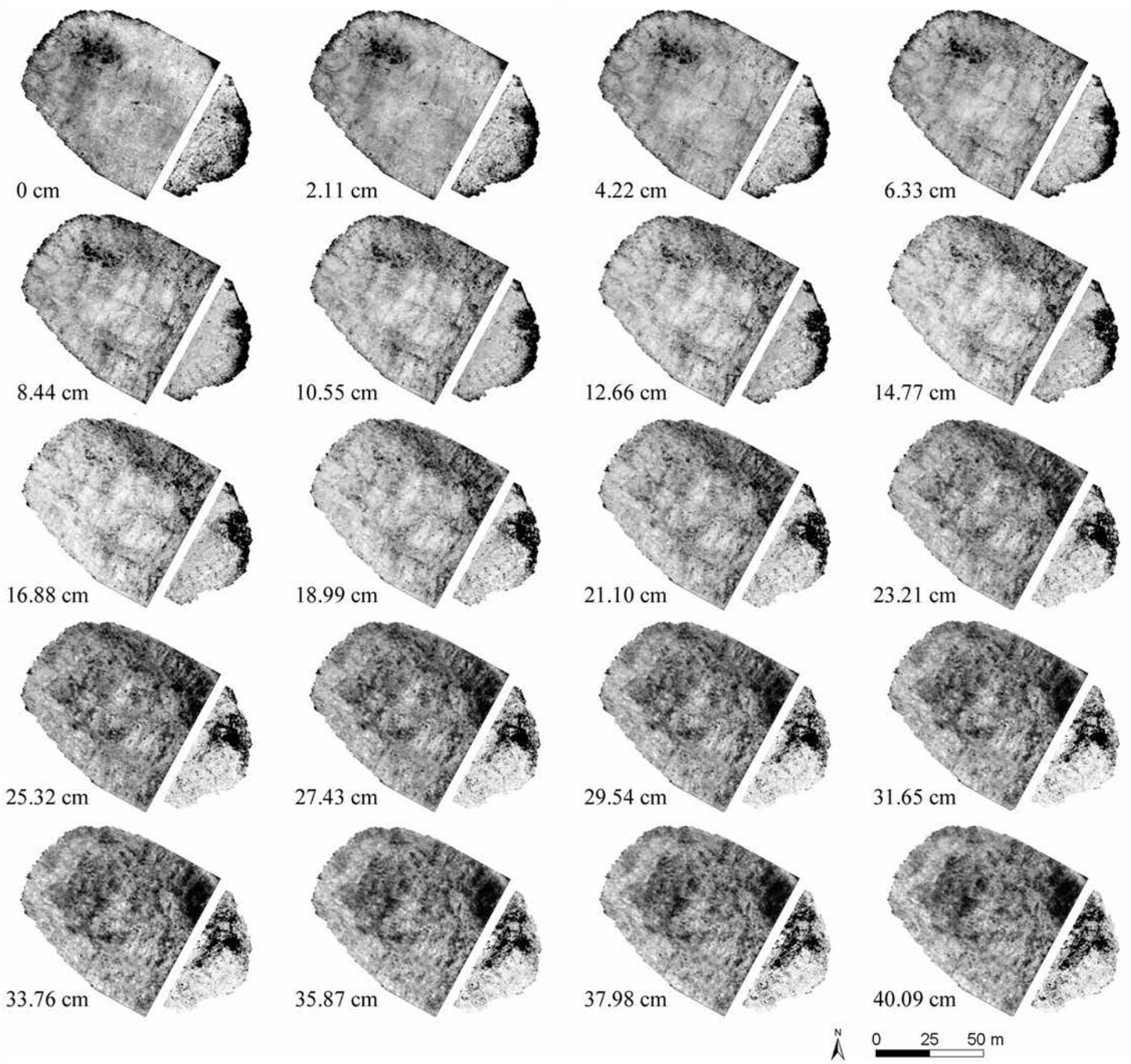

Fig. 5 GPR time slices showing buried structures at Sandby borg and their depth below the soil surface. – (Illustration A. Viberg).

The long linear features visible in the GPR data (**fig. 5**) are modern cattle paths, but some of the smaller linear features connected with the more manifest remains of house foundations may be derived from internal house structures, as is common in the Eketorp II ringfort (Stenberger 1973, 9). Another prominent feature to be seen in house 13, for example, is a square structure attached to the northern wall (**figs 4-5**). This structure partly coincides with a magnetic bipolar anomaly, most likely indicating that the area has been exposed to heat (**fig. 6**). These square structures have parallels in the Eketorp fort but their function is currently unknown. Possible room dividers are also visible, extending perpendicularly from the walls in several

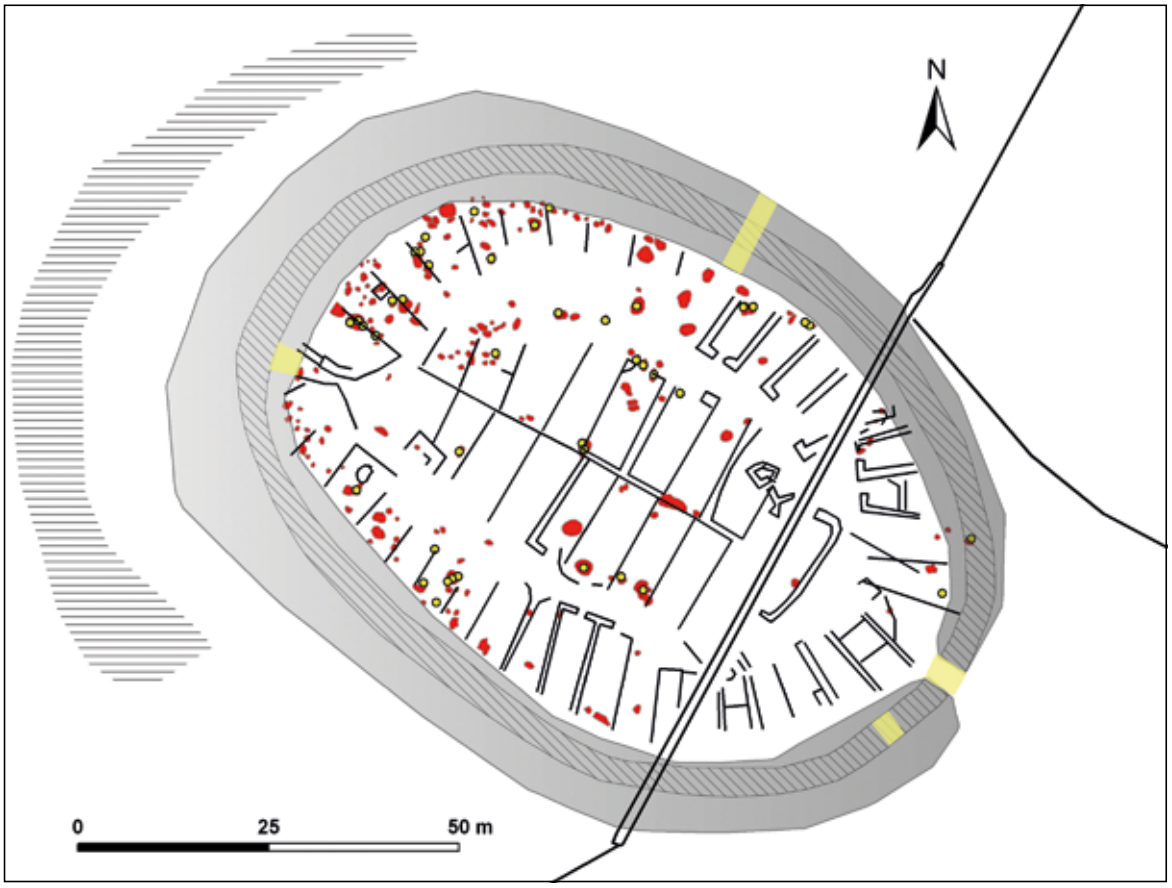

Fig. 6 Sandby borg. Interpretation of magnetometry data superimposed on the archaeological interpretation of the house foundations located by means of GPR. – Red polygons = bipolar features; small yellow circles = bipolar features of probable anthropogenic origin. – (Illustration A. Viberg).

houses (see houses 41, 49 and 51). These structures are also similar to the stall partitions found in several byres in the Eketorp fort (Stenberger 1973, fig. 12).

Some of the gaps between houses in the ground plan suggest gates in the wall (G1-G3 in **fig. 4**). The results of the GPR survey, however, indicate more than one possible location for the south-eastern gate (G2:1 and G2:2 in **fig. 4**), and it is not possible at present to decide which is the correct one. An example from Eketorp II suggests the possibility of two contemporary gates situated in close proximity (Borg/Näsman/Wegraeus 1976) and this could, of course, also be the case in Sandby borg. The gate in the north-west (G3), as proposed by A. Andrén, can be confirmed, as the design of the two adjacent buildings (houses 14-15 in **fig. 4**) and the visible traces in the perimeter wall itself clearly suggest a gate at this site. Only one doorway to a house is visible with certainty in the GPR data, and this leads into a possible gatehouse north of the north-western gate (house 14 in **fig. 4**).

The magnetometry data provided complementary information (cf. Viberg 2012) in which the direction of magnetisation of various bipolar magnetic features showed the location of possible burned features of anthropogenic origin, such as possible hearths or kilns (red polygons in **fig. 6**) and also many possible pits within the fort (blue polygons in **fig. 7**). Many of the magnetic anomalies coinciding with the walls in the GPR data (**fig. 6**) are most likely related to magnetic stones. This could also be the case for some of the suggested pit anomalies in **figure 7** as these also can be related to stones with elevated magnetic susceptibility values.

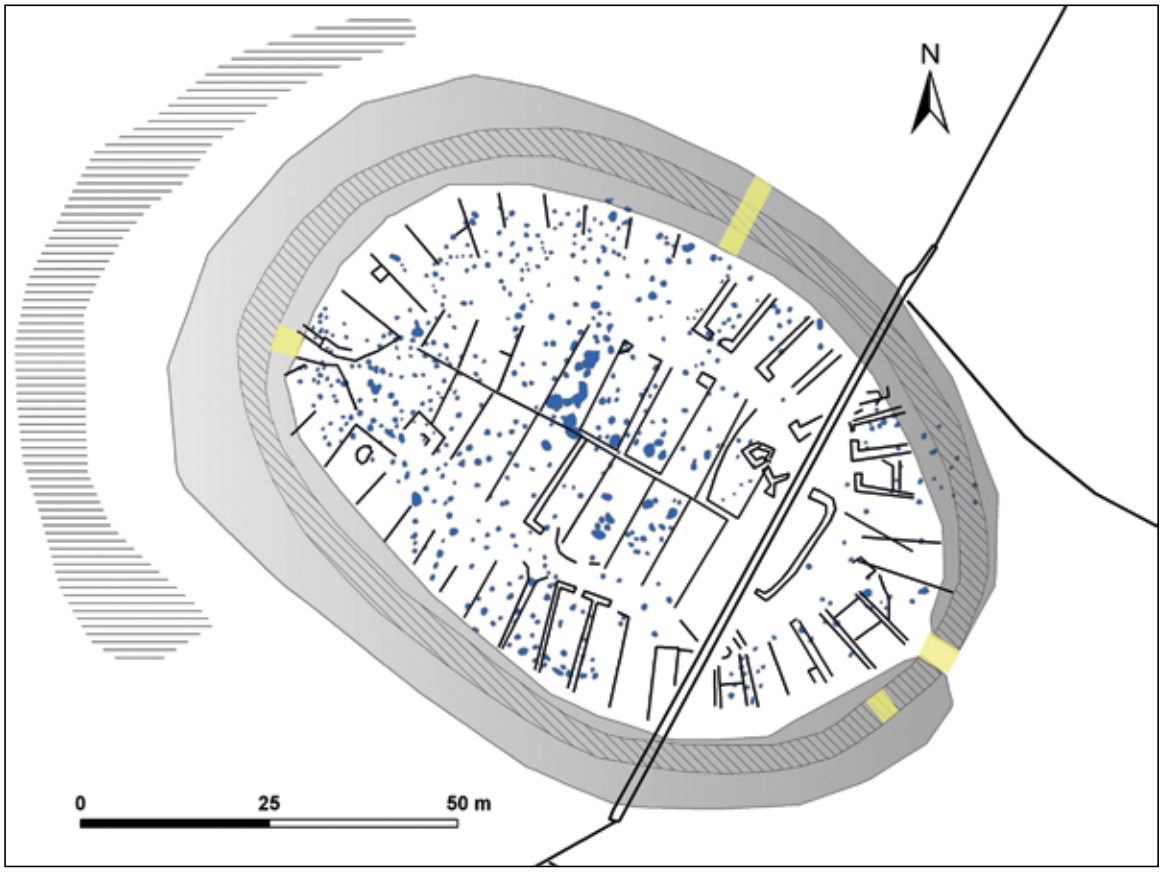

Fig. 7 Sandby borg. Possible pit features identified in the magnetic survey data (blue polygons) superimposed on the archaeological interpretation of the house foundations located by means of GPR. – (Illustration A. Viberg).

Metal detector survey 2010

As a consequence of the discovery of looting pits (cf. **fig. 2**), a metal detector survey was commissioned by the Kalmar County Board to recover additional finds. This yielded six gilded relief brooches and several other high status artefacts at five locations within the fort (**figs 8-9**). These objects can be dated to the Migration Period (c. 375-550) and more precisely to c. 460-490 by typological dating (based on work by Fischer/Victor 2011 and Fischer/López Sanchez/Victor 2011).

According to the GPR results, the majority of the deposits inside the houses were located next to the doors of houses 40, 43, 44 and 52 in the central complex and near the south-eastern wall of house 53 (**fig. 9**). The only possible exception was the deposit situated inside or outside the entrance to house 52. This ambiguity was most likely caused by the presence of a highly reflective layer overshadowing the relatively weak reflections caused by the walls of the house.

EXCAVATIONS

Assuming a similar context for the majority of the deposits discovered inside the fort, only three were selected for further archaeological investigations (**fig. 9**). The first trench, of dimensions 3.5 m × 1.5 m, was dug over the long side of house 53, the second, 4 m × 2 m, was placed over the entrance to house 40, and the third, 3 m × 2 m, was over the ambiguous context in house 52.

Fig. 8 The relief brooches found during the metal detection survey of Sandby borg. – (Photo © M. Jahrehorn, Oxider AB).

Deposit 1 (house 53)

The results of the excavations in this trench show a good correlation with the interpretations of the GPR data (**fig. 10**). The small discrepancy between the trace of the wall in the GPR data and the actual wall can be explained by the presence of highly reflective demolition layers masking the exact limits of the excavated wall (cf. **fig. 5**). The very shallow bedrock, situated at a depth of only 0.1 m in some parts of the trench, had a significant impact on the GPR results in the area west of the wall, greatly hindering the interpretation. The context of this deposit was confirmed as being the inside of house 53, next to the wall.

Deposit 2 (house 40)

The results of the excavations in this trench also display a good correlation with the GPR data, revealing the south-eastern end of house 40, with the deposit situated in one corner of the house (**fig. 11**). In addition, the excavations revealed two postholes just inside the entrance to the house, also visible as faint radar echoes at a depth of 15 nanoseconds approx. 0.3 m below the surface (cf. **fig. 5**). Given the distance

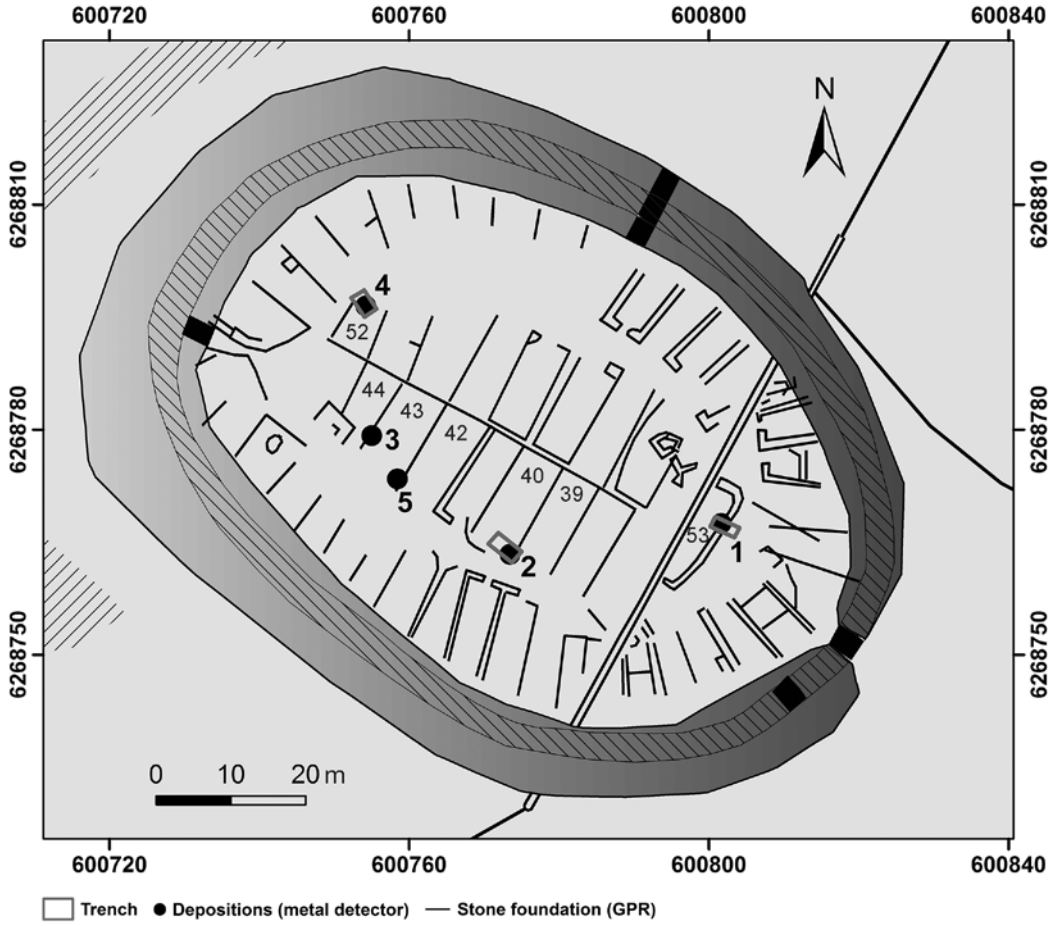

Fig. 9 Sandby borg ringfort. Location of the five deposits discovered after the metal detector surveys in 2010 and location of the trenches dug during the subsequent archaeological excavation in 2011. – Coordinates in Sweref99 TM. – (Illustration A. Viberg).

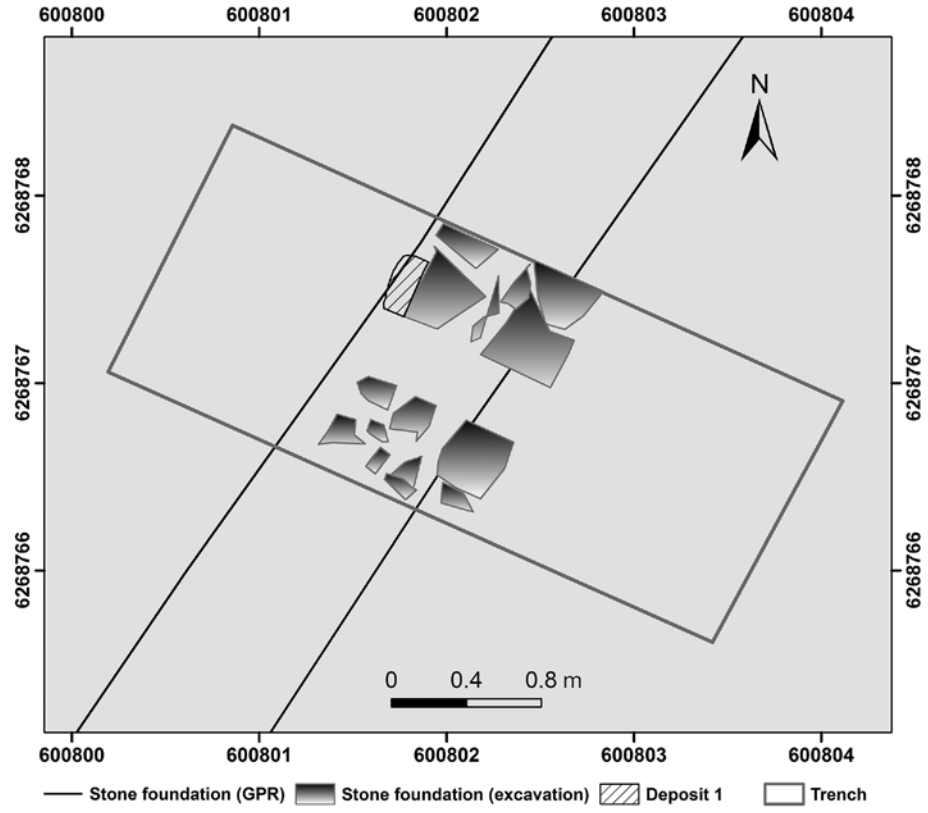

Fig. 10 Sandby borg ringfort. Archaeological excavation results and location of deposit 1 (house 53) in relation to the archaeological interpretation of the GPR data. – Coordinates in Sweref99 TM. – (Illustration A. Viberg).

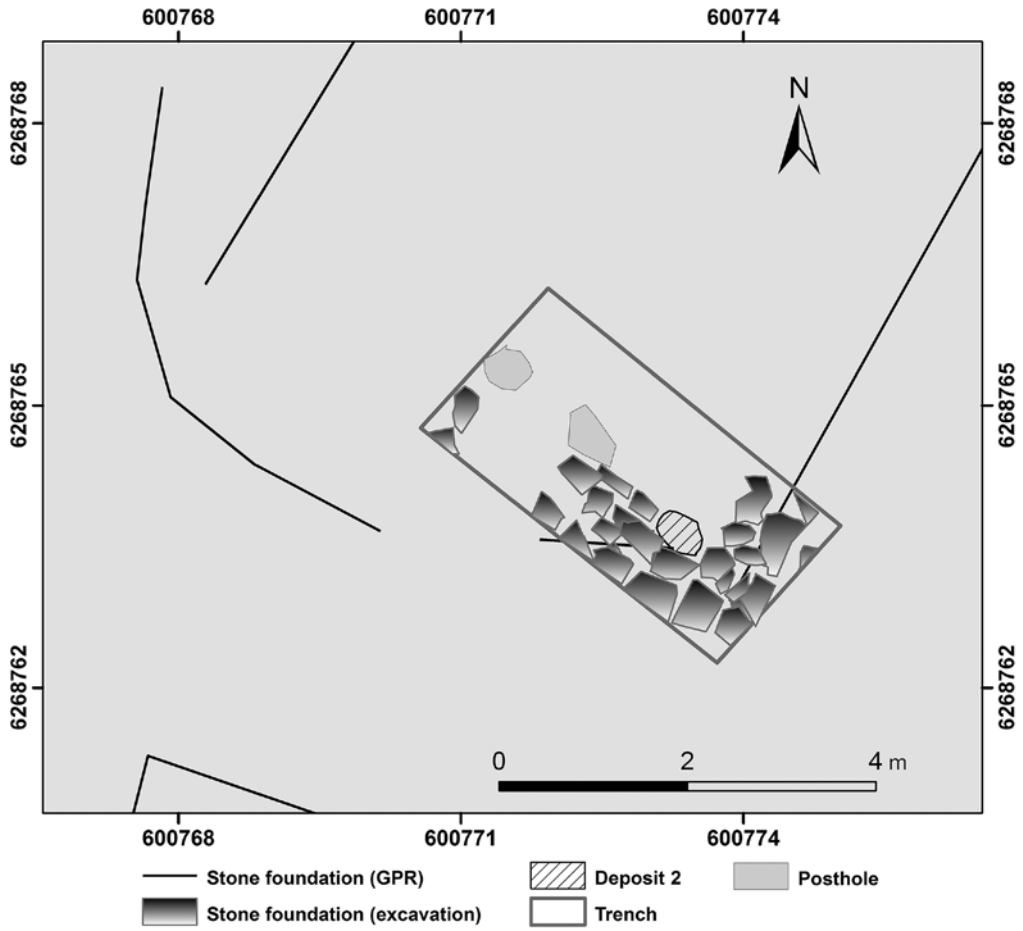

Fig. 11 Sandby borg ringfort. Archaeological excavation results and location of deposit 2 (house 40) in relation to the archaeological interpretation of the GPR data. – Coordinates in Sweref99 TM. – (Illustration A. Viberg).

between the radar transects, however, both of these postholes are too small to be identified and explained correctly and have therefore been omitted from the interpretation. The same goes for several other indications of very small possible postholes/pits in the GPR data.

The strong magnetic bipolar anomaly situated in the north-western corner of this house is very interesting (cf. fig. 6). It is located just outside this trench, and thus further excavations in the area will be needed to determine the cause of the anomaly, which is likely to be related to ferromagnetic objects within the house.

Deposit 4 (house 52)

The GPR data for this area were somewhat ambiguous and the likely context for this deposit could only be estimated. The result of the excavation does not reveal any clear structures as were found in the other two trenches (fig. 12), but there were two larger stones in the northern part of the trench that probably mark the northern end of house 52, indicating that this deposit also seems to be situated inside a building. A posthole was discovered in this particular house, but, given the distance between the radar transects, it was far too small to be visible in the GPR data.

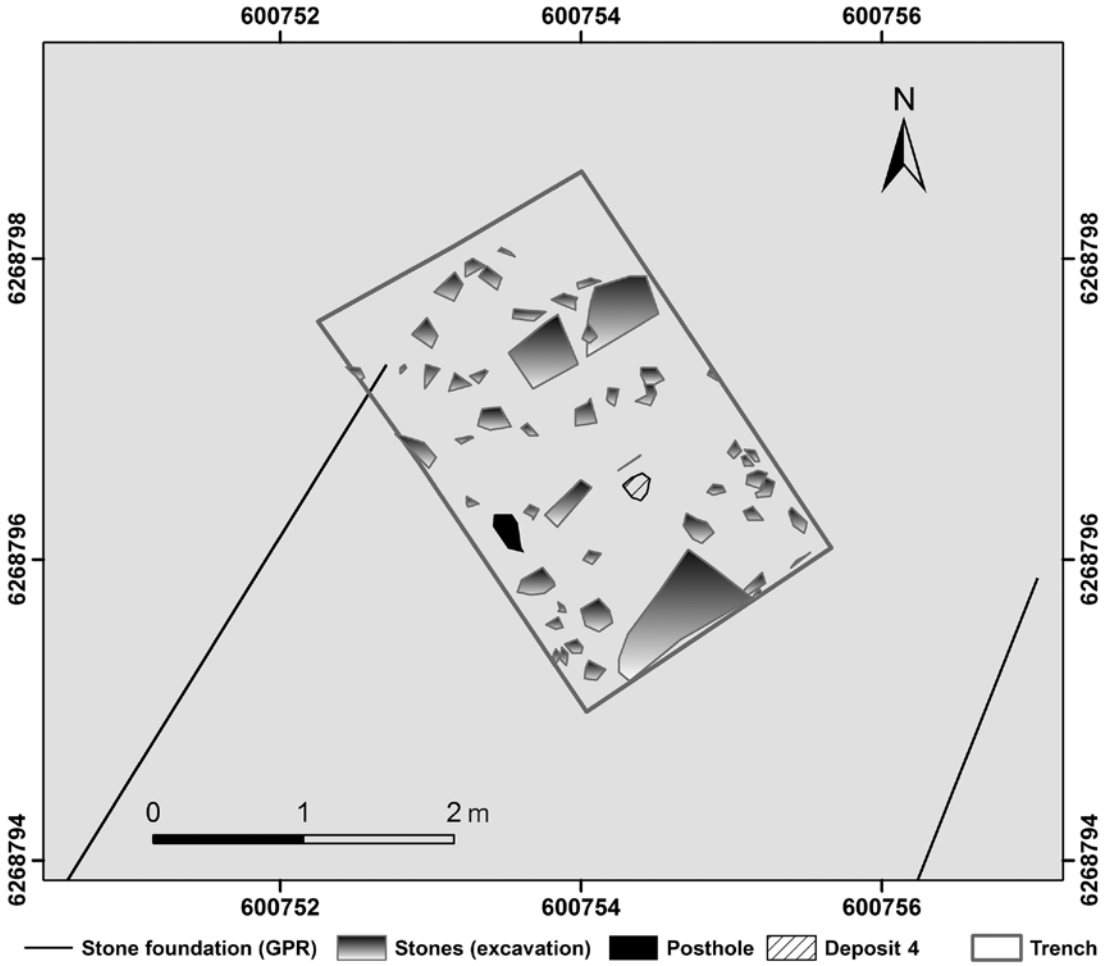

Fig. 12 Sandby borg ringfort. Archaeological excavation results and location of deposit 4 (house 52) in relation to the archaeological interpretation of the GPR data. – Coordinates in Sweref99 TM. – (Illustration A. Viberg).

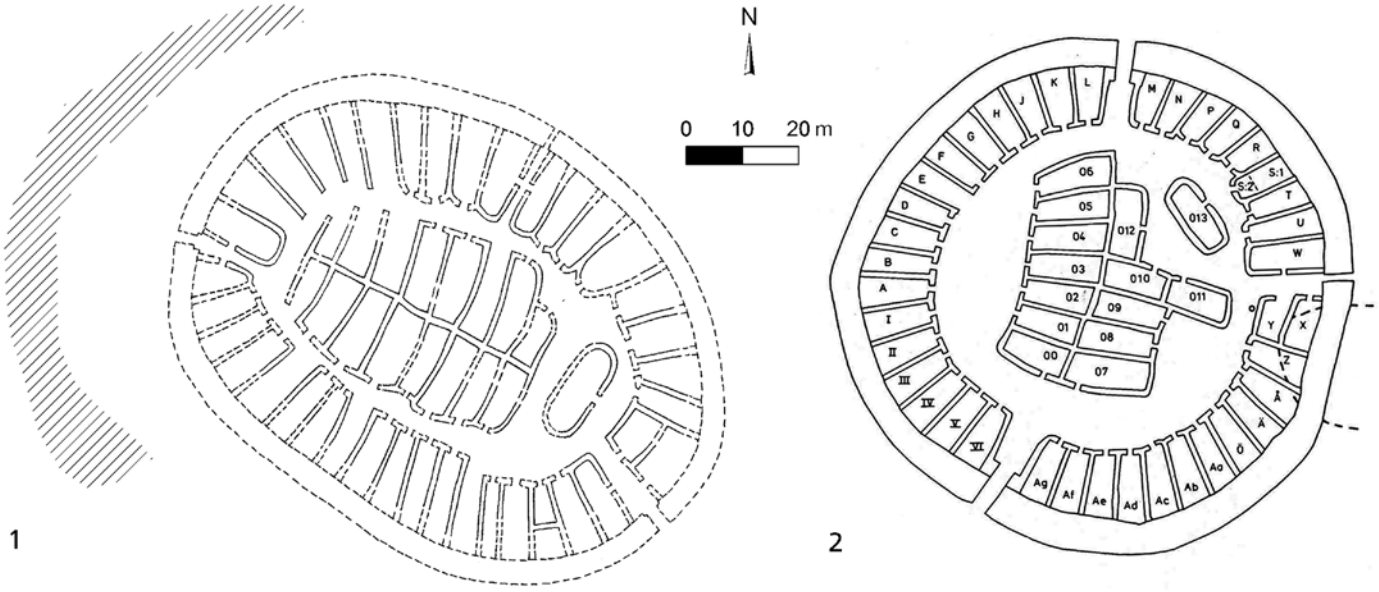

Fig. 13 **1** interpretation of the ground plan of Sandby borg ringfort based on the geophysical measurements. Solid lines represent walls confirmed by the GPR measurements. Dashed lines represent interpretations and the likely directions of walls not fully visible in the GPR data. – **2** ground plan of the excavated Eketorp II. – (1 illustration A. Andrén; 2 after Borg/Näsman/Wegraeus 1976).

DISCUSSION

The results of the geophysical surveys clearly show the ground plan of the fort, and the archaeological interpretation of the geophysical data, supported by the aerial photos, revealed some 37 houses placed radially along the inner wall of the fort together with a central group of 16 or possibly 17 house foundations. This adds up to a total of 53 or possibly 54 house foundations, which is in accord with earlier estimates (Fallgren 2008). The geophysical results have also provided clear evidence of a third, north-western gate in addition to the two gates already suggested. The ground plan does not seem to indicate that the fort had multiple settlement phases, as is the case with Eketorp, Gråborg, Triberga and Bårby, for example, since there are indications of houses having been rebuilt only in a small part of the GPR ground plan. This is also supported by the artefacts discovered in the course of the excavation and the depositions found during the metal detection survey, suggesting a date of c. 460-490 (cf. Fischer/Victor 2011; Fischer/López Sanchez/Victor 2011). A radiocarbon date obtained for a human metatarsal recovered from the trench in house 40 is concurrent with this date, pointing to the second half of the 5th century (Dutra Leivas/Victor 2014). The locations of the finds from the metal detection survey also seem to follow a specific pattern, in which the deposits were regularly situated in the right-hand corner just inside the house. The only exception to this apparent pattern is deposit 1 which was located next to the wall in the free-standing house 53. The houses in the south-eastern area seem to be considerably shorter than the rest, which may indicate that this section of the fort was built separately.

Sandby borg and the second settlement phase of Eketorp are contemporary and display great similarities with regard to their spatial layout. The interpretation of Sandby borg as presented in **figure 13** is an extended archaeological interpretation based on the GPR results and should be treated with some caution as many house walls are not fully visible in the GPR data. The two forts are obviously different in their overall shape, but the size of the area inside the outer perimeter of the ring wall is very similar in both cases (5280 m^2 at Eketorp II and 5140 m^2 at Sandby borg). Also, the number of houses inside the fort is corresponding, as Eketorp II has been shown to have contained 53 houses and Sandby borg 53 or 54. The house lengths are almost identical, although the foundations in Sandby borg are on average slightly longer than those in Eketorp II, c. 13 m as compared with c. 12 m, and the average house width is alike. Another similarity is the presence of a single free-standing house in the central building group, which has been interpreted in the case of Eketorp II as a combined storage and craft building (Edgren/Herschend 1995, 9). A corresponding house has also been documented at Ismantorp. The possible room dividers and other internal structures identified at Sandby borg are admittedly also paralleled at Eketorp II (Stenberger 1973, 9).

Although the construction of Sandby borg was most likely a collective effort on the part of neighbouring villages, the fort clearly differs from all the other ringforts on Öland by virtue of its placement in close proximity to the shoreline. Given the similar outer defences that seem to protect the main gate to be seen at Löt and Ismantorp, we think it is highly likely that the main gate at Sandby borg was the north-western one (G3). Both the northern and the north-western gates are clearly facing contemporary settlement remains and stone walls in the parishes of Sandby and Stenåsa, suggesting the possible origin of the fort's inhabitants, while the gate facing the sea could indicate the presence of a possible harbour in the vicinity of the fort. The Öland ringforts most likely differed in function and purpose, but the clear similarity between Sandby borg and Eketorp II speaks in favour of similar ideals and inspirations during their layout and construction. It is probable that the main function of Sandby borg, and for example Ismantorp (Andrén 2006, 36 f.), was connected with military activities of some kind, most likely as places of refuge in times of war. The similarities between Sandby borg and other Migration Period ringforts on the island, e. g. Löt, Mossberga, Lenstad and Treby, are difficult to estimate, as these sites have seen intense agricultural activity and

the remaining house foundations, if any, are in a fragmentary state or situated below ground. The dates of these forts are therefore highly uncertain, with the possible exception of Mossberga, where a Migration Period gilded relief brooch, similar to the brooches from Sandby borg, has been found.

CONCLUSIONS

It can be concluded that geophysical prospection surveys have provided vital information concerning the subsurface features at Sandby borg. Compared to the aerial photos of the site the geophysical surveys have shown a far greater level of detail regarding the internal features of the fort while keeping the need for large-scale intrusive excavations to a minimum.

From an archaeological point of view the layout and internal features of Sandby borg resemble those of the already excavated and similarly dated Öland ringfort Eketorp II. The similarities include houses placed radially along the inside of the outer perimeter of the ring wall, an inner building group located in the centre of the fort and the presence of a free-standing house within the central building group. The two forts are also comparable in size and contain a similar number of house foundations. Contrary to Eketorp II and the other Öland ringforts, however, Sandby borg is located very close to the sea.

The two gates that point towards contemporary prehistoric settlements indicate where the initiative to build the fort may have come from, while the gate pointing towards the sea could indicate a possible harbour in the vicinity. Sandby borg seems to have been in use for a very limited period of time during the Migration Period, as suggested by the artefacts recovered during metal detection survey and excavations and by the GPR results, which do not contain any evidence of multiple building phases. The cause of the abandonment of Sandby borg is currently unknown, but the function of the fort was most likely primarily connected with military activities, probably as a place of refuge in times of war.

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Zusammenfassung / Abstract / Résumé

Der Ringwall am Meer: archäologisch-geophysikalische Prospektionen und Ausgrabungen in Sandby borg (Öland)

Archäologische Untersuchungen und gute Luftbilder haben die Grundmauern von Häusern in mehreren Ringwällen auf der Insel Öland, östlich des schwedischen Festlandes gelegen, identifiziert. Eine der Fundstellen, Sandby borg, wurde für weitere Forschungen mittels Bodenradar und Geomagnetik ausgewählt. Anschließend wurde eine Ausgrabung durchgeführt, um die geophysikalischen Ergebnisse zu überprüfen. Die Messungen der Geophysik zeigen deutlich 36 oder 37 steinerne Fundamente von Häusern, die sich radial an die Mauer der Befestigung anlehnen, sowie 16 oder 17 ähnliche Steinfundamente in einem zentralen Bebauungsareal. Die geophysikalischen Untersuchungen geben auch Informationen über andere im Boden verborgene Strukturen innerhalb der Befestigung und bestätigen die Lokalisierung eines dritten Tores im nordwestlichen Bereich der Anlage. Soweit es sich belegen lässt, wurde der Ringwall für militärische Zwecke oder als Fluchtburg in unruhigen Zeiten während einer begrenzten Zeitspanne im späten 5. Jahrhundert genutzt.

The ringfort by the sea: archaeological geophysical prospection and excavations at Sandby borg (Öland)

Archaeological investigations and clear aerial photos have identified the presence of house foundations within several ringforts on the island of Öland, east of the Swedish mainland. One of them, Sandby borg, was selected for further investigations by means of a ground-penetrating radar (GRP) and magnetometry survey. A subsequent excavation was carried out to validate the geophysical results. The results of the geophysical survey clearly show the presence of 36 or 37 stone foundations for houses situated radially around the wall of the fort as well as of 16 or 17 similar house foundations in a central building group. The geophysical results also provided information on other buried features within the fort and also confirm the location of a third gate situated in the north-western part of the fort. The available evidence indicates that the ringfort was used for military purposes, or as a place of refuge in times of unrest, for a limited period of time during the late 5th century.

L'enceinte circulaire près de la mer: prospections archéologiques et géophysiques à Sandby borg (Öland)

Des études archéologiques et de bonnes photos aériennes ont permis d'identifier la présence de fondations de maisons au sein de plusieurs enceintes circulaires de l'île d'Öland, au large de la Suède continentale. L'un de ces sites, Sandy borg a été sélectionné pour faire l'objet d'une étude plus approfondie à l'aide d'un radar à pénétration de sol (RPS) et de prospections magnétométriques. Une fouille a ensuite été menée afin de valider les résultats de la géophysique. Les résultats de l'étude géophysique montrent clairement la présence de 36 ou 37 fondations de maisons en pierre implantées de manière radiale le long du rempart ainsi que de 16 ou 17 fondations similaires groupées dans un bâtiment central. Les résultats de l'étude géophysique livrent également des informations sur d'autres structures à l'intérieur du fort et confirment l'emplacement d'une troisième porte située au nord-ouest du fort. Les éléments disponibles indiquent que cette enceinte circulaire a été utilisée dans un but militaire ou comme refuge lors de périodes troublées sur une courte période à la fin du 5e siècle. Traduction: L. Bernard

Schlüsselwörter / Keywords / Mots clés

Schweden / römische Eisenzeit / Völkerwanderungszeit / Georadar / Geomagnetik
Sweden / Roman Iron Age / Migration Period / ground-penetrating radar / magnetometry
Suède / âge du Fer romain / période des Grandes Invasions / radar à pénétration de sol / magnétomètre

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