Supplement 1

The ringfort

A stone wall 4 to 5 m in height with at least three gates enclosed an area of 5,000 m^2 containing houses and a surrounding street. The house foundations and outer walls were characteristically made of limestone, the roofs were turfed, and the inner wooden walls were made of oak or juniper (Fallgren 2006:25–28; Heimdahl 2016; Victor 2015). Most of the houses in Sandby borg were rectangular in shape, with the door on one of the short ends, pairs of roof-bearing posts, and partially stone-paved floors (e.g., Victor 2015). Although the function of the houses is difficult to establish, barns, stables, and storage buildings were most probably located within the walls. Since carcasses of dogs, sheep, pigs, and horses have been documented inside the ringfort, it is clear that animals were cared for within the fort and perhaps walked around freely (e.g., Dutra Leivas and Victor 2011; Gunnarsson et al. 2016; Victor et al. 2013). In addition, cattle and wild species such as rodents, harbor seals, fish, and birds were living close by.

References Cited

Dutra Leivas, Ivonne, and Helena Victor. 2011. *Sandby borg I: Undersökningar 2011, Sandby sn, Mörbylånga kommun, Öland.* Kalmar läns museum, Kalmar.

Fallgren, Jan Henrik. 2006. *Bebyggelse och samhälle på Öland 200–1300 e. Kr.* Ph.D. dissertation, Uppsala University.

Gunnarsson, Fredrik, Helena Victor, and Clara Alfsdotter. 2016. *Sandby borg VII: Undersökningar 2015, Sandby sn, Mörbylånga kommun, Öland*. Kalmar läns museum, Kalmar.

Heimdahl, Jens. 2016. Växtmakrofossilanalyser. In *Sandby borg V: Ögonblicket under markytan. Seminarieundersökning i Sandby borg 2014. Sandby sn, Öland,* edited by L. Papmehl-Dufay and C. Alfsdotter. Kalmar läns museum, Kalmar, pp. 50–51.

Victor, Helena. 2015. Sandby borg: Ett fruset ögonblick under folkvandringstiden. In *Grävda minnen: Från Skedemosse till Sandby borg*, edited by Kjell-Håkan Arnell and Ludvig Papmehl-Dufay. Meddelanden från Kalmar läns hembygdsförbund och Stiftelsen Kalmar läns museum, årg. 95. Kalmar läns museum, Kalmar, pp. 96–115.

Victor, Helena, Andreas Emilsson, and Mattias Frisk. 2013. *Sandby borg III: Undersökningar 2013. Sandby sn, Mörbylånga kommun, Öland*. Kalmar läns museum, Kalmar.

Supplement 2

Excavation and preparation of material

Single-context recording was used during the excavations. The documentation was carried out through photography, photogrammetry, and GIS mapping. The site was excavated by hand, and the soil underneath the topsoil was sieved (wet or dry) with 2 or 4 mm sieves. Macrobotanical samples were collected regularly, and metal detecting was conducted throughout the excavations. Human remains were documented by Alfsdotter (apart from ID1 and ID2 reported in Victor and Wilhelmson 2012 and Victor et al. 2013) with 3D and GIS documentation, descriptions of the skeletal articulation, position, and stratigraphic relationships. Due to vast sun bleaching and hard wind, the preservation of the bones was negatively affected at a fast pace. Therefore, the in situ documentation was made effective. Archaeothanatological descriptions of all partially articulated and articulated skeletons were produced by Alfsdotter in the post-processing of the documentation.

The skeletal remains were cleaned indoors. Dry remains were only carefully brushed, but humid or wet skeletal remains were cleaned under water in sieves. Some crania were taken in with the soil still attached to be excavated indoors, due to very high fragmentation and lack of time in the field (Alfsdotter In press; Gunnarsson et al. 2016; Papmehl-Dufay and Alfsdotter 2016).

References Cited

Alfsdotter, Clara. In press. Humanosteologi i Sandby borg: In *Sandby borg IX. Undersökningar 2016, Sandby sn, Mörbylånga kommun, Öland,* edited by Ludvig Papmehl-Dufay and Helena Victor. Report prepared for Kalmar läns museum.

Gunnarsson, Fredrik, Helena Victor, and Clara Alfsdotter. 2016. *Sandby borg VII: Undersökningar 2015, Sandby sn, Mörbylånga kommun, Öland*. Kalmar läns museum, Kalmar.

Papmehl-Dufay, Ludvig, and Clara Alfsdotter, eds. 2016. *Sandby borg V: Ögonblicket under markytan. Seminarieundersökning i Sandby borg 2014. Sandby sn, Öland*. Kalmar läns museum, Kalmar.

Victor, Helena, Andreas Emilsson, and Mattias Frisk. 2013. *Sandby borgs skrifter 3: Undersökningar 2013. Sandby sn, Mörbylånga kommun, Öland*. Kalmar läns museum, Kalmar.

Victor, Helena, and Helene Wilhelmson. 2012. *Sandby borgs skrifter 2: Undersökningar 2012, Sandby sn, Mörbylånga kommun, Öland*. Kalmar läns museum, Kalmar.

Supplement 3

Environmental reconstruction: Climate and topography

In order to interpret the taphonomic process of the site, mapping the environmental conditions is of the greatest importance. The island of Öland consists of younger sedimentary calcareous bedrock: limestone, sandstone, and slate (Johansson 1984). The eastern shoreline does not have an archipelago and, beyond the sandy ridge (Ancylusvallen) near the shoreline, the shallow waters on the east coast continue for several hundred meters. The land has risen a few meters since the Migration period, meaning that structures on land were located closer to the sea (Viberg 2012). A thin layer of limy moraine of glacial or glaciofluvial origin covers the flat terrain, and limestone is often exposed (Johansson 1984). A reconstruction of the climate during the Scandinavian Migration period implies, in spite of a general cooling trend, that the temperature of the region at the end of the fifth and first decades of the sixth century was initially a few degrees warmer than in modern times (Esper et al. 2012a, 2012b). In association with the subsequent decrease in temperature, a volcanic eruption occurred in A.D. 536, which is believed to have led to major climatic changes (Esper et al. 2012a; Gräslund and Price 2012). Moreover, pollen analyses show that the landscape of southern Öland was open but with trees such as birch, pine, and juniper (Köningsson 1969:138, 151, 155). Macro-fossil analyses from the ringfort have shown traces of wild plants such as heather, sedge, black thorn, wild strawberries, and violet, among others. Furthermore, grains, primarily barley but also oat, rye, wheat, flax, black mustard, and spelt, have been identified (Heimdahl 2014, 2016; Larsson 2012).

References Cited

Esper, Jan, Ulf Büntgen, Mauri Timonen, and David C. Frank. 2012a. Variability and extremes of northern Scandinavian summer temperatures over the past two millennia. *Global and Planetary Change* 88–89:1–9. DOI: 10.1016/j.gloplacha.2012.01.006.

Esper, Jan, David C. Frank, Mauri Timonen, Eduardo Zorita, Rob J. S. Wilson, Jürg Luterbacher, Steffen Holzkämper, Nils Fischer, Sebastian Wagner, Daniel Nievergelt, Anne Verstege, and Ulf Büntgen. 2012b. Orbital forcing of tree-ring data. *Nature Climate Change* 2(12):862–866. DOI: 10.1038/NCLIMATE 1589.

Gräslund, Bo, and Neil Price. 2012. Twilight of the gods? The "dust veil event" of AD 536 in critical perspective. *Antiquity* 86(332):428–443. DOI: 10.1017/S0003598X00062852.

Heimdahl, Jens. 2014. Makroskopisk analys 2014. In *Sandby borg IV: Undersökningar 2014. Sandby socken, Mörbylånga kommun, Öland*, edited by Helena Victor. Kalmar: Kalmar läns museum, p. 55.

Heimdahl, Jens. 2016. Växtmakrofossilanalyser. In *Sandby borg V: Ögonblicket under markytan. Seminarieundersökning i Sandby borg 2014. Sandby sn, Öland,* edited by Ludvig Papmehl-Dufay and Clara Alfsdotter. Kalmar läns museum, Kalmar, pp. 50–51.

Johansson, Hans G. 1984. *Geologi*. Särtryck ur Handbok BYGG Geoteknik. Statens väg- och trafikinstitut (VTI), Stockholm, pp. 17–42.

Köningsson, Lars-König. 1969. *The Holocene History of the Great Alvar of Öland*. Thesis, Uppsala University.

Larsson, Mikael. 2012. Makroanalysrapport. In *Sandby borg II: Undersökningar 2012, Sandby sn, Mörbylånga kommun, Öland*, edited by Helena Victor. Kalmar läns museum, Kalmar, p. 36.

Viberg, Andreas. 2012. *Remnant Echoes of the Past: Archaeological Geophysical Prospection in Sweden.* Theses and Papers in Scientific Archaeology 13. Stockholm University, Stockholm.