Henrik Jansson, Georg Haggrén, Kristiina Mannermaa & Tanja Tenhunen

SETTLEMENT HISTORY AND ECONOMY OF THE GUNNARSÄNGEN SITE AT THE HANKO PENINSULA

Abstract

Hangethe or Hanko, as it is called today, lies in a maritime environment. The easiest way to get to Hanko was by sea. The Gunnarsängen site at the very end of the peninsula was excavated between 2003 and 2006. Written sources are of little help for interpreting the medieval settlement history of Hanko. Archaeology offers possibilities for gaining additional information. Gunnarsängen was probably inhabited by the late Iron Age. This paper discusses the structures and activity areas at Gunnarsängen and what they reveal about the subsistence and economy of its medieval inhabitants. It will be shown that the maritime setting had an impact on the site located literally where the land ends and meets the sea.

Keywords: maritime environment, Hanko, Gunnarsängen, Middle Ages, osteology, macrofossils, settlement, subsistence.

Contact: Archaeology, Department of Philosophy, History, Culture and Art Studies, P.O. Box 59, 00014 University of Helsinki, Finland. E-mail: henrik.jansson@helsinki.fi

INTRODUCTION

The Hanko peninsula (Fi. Hankoniemi) is well known as the southernmost point of Finland. Over the centuries, a major part of all the maritime traffic between the inner parts of the Gulf of Finland – including Tallinn – and the rest of the Baltic area have passed near Hankoniemi. Therefore it is quite natural that the first survived literary source where Hanko (Sw. Hangö) is mentioned is an early medieval description of a sea route, the so-called Danish itinerary. The source has been dated to the late 13th or early 14th century but the route is described to have an older origin. It begins from the border area between the medieval Denmark and Sweden or from present-day provinces of Scania and Blekinge. The itinerary describes a route that follows the Swedish east coast where after it turns eastward through the archipelago and southern coast of Finland and finally reaches Tallinn. Several harbour sites from the archipelago and northern coast of the Gulf of Finland are mentioned along the route. One of them is *Hangethe* or *Cuminpe* as it was called in Finnish (Gallén 1993: 50–1).

Hangethe or Hanko, as it is called today, lies in a very maritime environment. The easiest way to get to Hanko was via the sea. It has long been suspected that there was some kind of settlement in Hanko when the Danish itinerary was written. A site called Gunnarsängen, excavated between 2003 and 2006, proved that a contemporaneous settlement can be found on the peninsula. This article presents and discusses the results of the first three years (2003–2005) of research, and also some of the main results of the 2006 excavations.[1] The focus is on discussing the different structures and activity areas and what they tell about the subsistence and economy of the medieval inhabitants at Gunnarsängen. As will be shown, the maritime setting affected the site, which is located literally where the land ends and meets the sea. At first there will be a presentation of the historical records and the picture we get from these. This will be then discussed together with the archaeological, osteological and paleobotanical records. Finally, the correlations and differences between historical records and archaeological records will be discussed.

HANKO IN HISTORICAL SOURCES

After the Danish itinerary, Hangethe is mentioned the next time in the late 1390s. That source also concerns seafaring. The castellan of Raseborg, Tord Röriksson Bonde wrote to the council of Tallinn about a ship which had either anchored or come to shore in Hanko (FMU 1043). In 1508 the castellan of Viborg, Erik Turesson Bielke, asked the bishop of Turku to collect ships and troops to Hanko or Jungfrusund (FMU 5352). The importance of Hanko as place important for the sea routes can be clearly seen even from a later itinerary survived from the southern coast of Finland. In 1555 a nobleman called Jacob Teitti described the route beginning from Korpoström in the southwest archipelago of Finland, where a coastal route crossed the route between Turku and Stockholm. Several harbour sites described in this mid-16th century manuscript can also be found from the Danish itinerary (Teitti 1894). Teitti's description gives us some hints about the inhabitants of Hanko and several other harbour sites earning some of their livelihood from piloting. In 1575, King Johan III appointed three peasants from Hanko to official pilots who were exempted from taxes (Boström 1968: 57). Later tax records confirm that this privilege was followed in practise (e.g., KA 3437: 10v).

The importance of Hanko for seafarers can also be seen in the oldest maps, such as Jacob Ziegler's Ptolemaist map dating from 1532. Two decades later Olaus Magnus states in his famous work *Historia de gentibus septentrionalibus* that Hanko has the very best harbour in the whole *northern sea*. The importance of the harbour site in Hanko is clearly visible also from hundreds of rock carvings made by seafarers at a harbour site called Hauensuoli, located at the tip of the peninsula and described by Olaus Magnus (1555: 116–7). These carvings consist of both coats of arms made by noble men and simple marks made by common seafarers. Unfortunately, a great deal of the oldest carvings, among them some royal carvings, has been destroyed during the centuries. The earliest survived carving is from the late 15th century and from the 16th century onwards they are abundant (Hausen 1902; Boström 1968: 26–7). The importance of the Hanko harbour has to do with the fact that it is not frozen during most of the year as the other harbours in Finland. Still in the 19th century, Hanko was the only winter harbour in Finland and an important life line to the outer world.

A great deal of the written sources concerning Hanko deals with seafaring. Fortunately, the tax records offer us also some information about the local inhabitants, their subsistence, economy and settlement. The earliest survived tax record from 1451 shows that Hanko was the centre of a *bol*, that is, a group of hamlets paying their taxes together (FMU 2898). This source reveals that the inhabitants in Hanko paid a great deal of their taxes in current money already in the mid 15th century.

Beginning in 1539/1540, King Gustavus Vasa ordered that every bailiff had to deliver his accounts to the royal chancellery and chamber, where they were not only checked but also archived. As a result, we have annual tax records and accounts from practically every Swedish province from the 1540s onwards. One of those records was the land register from which we can get information about each single farm. Unfortunately, the land registers of Hanko and the entire Tenhola parish pre-dating 1570 have disappeared. At that time, there were six farms in Hanko (KA 3317). Hanko was thereby one of the largest hamlets when comparing to other settlements in the parish of Tenhola. There were some hamlets with six or seven farms, but only Rilax, located about 15 km to the north, with its ten farms was clearly larger than Hanko.

The land register does not reveal much of the livelihood of the single farms in Hanko because taxes recorded in it were similar in the whole parish. Much more informative in this respect are the ecclesiastical tax records that have survived from late 1540s onwards. From the oldest record of *näbbskatt*, which is a personal tax dated to 1548, we know that there were seven farms in Hanko – one of the farms was abandoned in the 1560s. *Näbbskatt* was paid for every adult person in each household. According to the tax record, there were on average 3.8 adults in each of the seven farms in Hanko compared to 3.0 adults in the whole Tenhola parish. The number of adults in the largest household in Hanko was six (KA 3016).

Another ecclesiastical tax which the crown began to overtake during this time was the tithe. The oldest survived tithe records from the Tenhola parish are from 1552 (KA 3003). The seven farms in Hanko paid two to four *kappa* (1 *kappa* = 4.58

litre) barley each. We have tithes records from four years in the 1550s, and during this period each peasant paid annually on average 2.7 kappa of grain. In contrary to most of Tenhola parish, the peasants in Hanko did not pay any rye as tithe which means that they cultivated mostly barley. The only exception was in 1552 when the wealthiest peasants in Hanko, Lars Ivarsson, paid not only four kappa barley but five kappa rye too. In one single year, 1556, the tithe paid for other cereal than barley and rye from Tenhola parish has been registered. According to this record the farmers on the Hanko peninsula did not cultivate wheat and oats, contrary to the peasants on the more mainland hamlets (KA 3060, 3). On the grounds of the tithe, it seems that the peasants in Hanko concentrated on growing barley during the 16th century.

The third ecclesiastical tax was the so-called cow tax. The peasants paid 1 pound (= 425 g) butter for every milking cow. For cows from which they did not get any milk the peasants were obliged to pay ½ pound of butter. It is not possible to count the total number of cows, but based on the cow tax records we can get an index representing the amount of cattle in each farm. In 1556 the seven farms in Hanko paid together 41 pounds of butter, of which the owner of the largest cattle, Mats Jönsson, paid 10 pounds. Each farm in Hanko paid cow tax in average 5.9 pounds while the average farm in the whole Tenhola parish paid only 3.6 pounds (KA 3058, 36). We can estimate that in the 1550s there were 4–5 milking cows in each farm. However, after a few years the cow tax paid by peasants in Hanko decreased heavily, and in 1565 every farm holder in Hanko paid only 1 pound, except Jacob Ivarsson who paid 3 pounds. In 1571 the six farms in Hanko paid on average 2 pounds in cow tax which meant that there were only one or two milking cows in each farm.

In 1571 an extraordinary tax, the so-called silver tax, was collected in Sweden. In the silver tax records the domestic animals were registered. This gives us an opportunity to compare silver tax records with the cow tax indexes from the same year. The six peasants in Hanko had a total amount of 16 grown up cows (Soikkeli 1912). According to this there were on average 2.7 cows on each farm which is rather close to the index of the cow tax from that year.

Based on the silver tax record we know that each peasant had one horse. Without horse it was quite impossible to cultivate. The silver tax is the only archival source from the 16th century which reveals statistical data of cattle other than mature cows. In 1571 each peasant in Hanko had in addition to grown-up cows on average one calf, 2.5 sheep and 1.8 goats. As seen in the cow tax records there were obvious variation in the wealth between the peasants. The wealthiest peasant in Hanko, Jacob Ivarsson, owned about a third of all the cattle in the hamlet. In 1571 there were practically no pigs in the farms in the whole Hanko peninsula. In contrast to this, the peasants in the mainland hamlets usually owned one pig (Soikkeli 1912).

The medieval and early modern taxes do not usually give much information on fishing. Besides that the peasants in Hanko began in the early 1560s to pay their tithe in fish instead of grain. However, there was also one other tax paid collectively for a whole tax area, the *bol*. In Tenala, there were 17 *bols*. The peasants in Hanko formed a *bol* of their own. The *bol* tax paid from Hanko *bol* differed from the same tax paid from the other *bols* in Tenala. Most of the *bol* tax paid from Hanko consisted of current money and fish. They paid 33 mark 7 öre 9 penning in silver money. It seems that the people in the Hanko *bol* had significantly more income in current money than the peasants in the mainland hamlets. Furthermore, the 38 peasants on the Hanko peninsula together paid a little more than 7 barrels of salted cod and 2400 dried cods (KA 3033, 23v). The abundance of cod demonstrates the importance of fishing in Hanko.

Additionally, the Crown collected certain separate taxes from some of the most productive fishing places. The peasants in Hanko paid annually 600 dried cods for the fishing around Gunnarsören, which is a small group of rocky skerries about five kilometres northwest from the harbour of Kapellhamnen (KA 3033, s. 3).

The Swedish Crown began the mapping of the villages and hamlets in Finland in the 1640s and onwards. Land surveyor Hans Hansson drew a map of Hanko in 1647. On his map, we can see five farmsteads of which two had already been abandoned. Three of the farms were placed around an area which is today called Gunnarsängen. Two farms were some hundreds of metres further to the north. The landscape in the Hanko

area was not easy to cultivate. Arable land was found in areas between rocks and unfertile sandy and rocky areas. On one field – Näsbrötan – the peasants sowed 1 barrel 15 kappa, whereas a total of only 3 to 24 kappa of grain were sown but on the other fields. It can be estimated that one kappa grain was sown on 150 m^2 or 1.5 are. According to the map, the smallest field was only 4–5 are, and the largest about 0.7-0.8 ha. The total area was only about 3–3.5 ha and it has to be underlined that in two-crop-rotation each year only half of the fields were sown. In 1705, the fields were measured for the first time, resulting in an area of 4.9 barrel land or ca. 2.5 ha. The area of the fields in the whole hamlet was less than an average farm in the mainland of the south-western Finland (Kaukiainen 1980: 80–3). At that time, there were four surviving farms in Hanko. These four farms were called Backa, Gunnars, Västergård and Östergård (KA: MMA B1a 2; MMA Hanko B46 34/1; Ekström 1987: 26). According to the cadastral maps, less than one barrel of grain was sown annually on each farm. In the Middle Ages, the area cultivated by an individual farm was probably even smaller because four of the seven medieval farms had already been abandoned before the late 1640s.

GUNNARSÄNGEN AND ITS RESEARCH HISTORY

Location and environment

Gunnarsängen is located in the south-western part of the Hanko peninsula (Fig. 1). Hanko is a part of the Salpauselkä-1 ridge that rises above sea level in the area and continues toward northeast through Uusimaa and towards Joensuu in Northern Karelia. Large parts of the peninsula consist of moraine gravel, sand and barren bedrock elevations. The outer end of the peninsula is a kilometer-long narrow sandy point with dunes, which has always been a problematic place for sailors to pass. The vegetation close to the beach zone, where it still is in more or less natural condition, is dry and scarce, consisting mostly of coniferous trees with pine as the dominant one.

The Gunnarsängen site is located on a gentle sandy slope that is cut by a road. The road has been in the same location at least since the 18th century when it is marked on a cadastral map. The seashore is today 300 m towards southwest, but in the early medieval period it was only 100–150 m away. At that time there was a lagoon shaped inlet, today called Kapellhamnen (Chapel Harbour),

Fig 1. Hanko is located at the most Southern tip of mainland Finland and the Gunnarsängen site at the end of the peninsula.

which was protected from most wind. The sea around the peninsula is mostly open sea and not many sheltered bays or inlets exist on the shoreline. The sheltered inlet close to Gunnarsängen is actually one of the very few protected places in the area. The lower part of the very gentle slope where the site was during the Middle Ages and early modern era is a damp area suitable for meadows. Towards the north the site is restricted by a hill of barren bedrock cliffs, which has been providing shelter from the northern winds.

Today Gunnarsängen is a part of the Hanko city area. The Gunnarsängen area is located in an area still called the Hanko village while the city center itself has developed a few kilometers south of this area. The site has been preserved from destruction because it has never been built or developed. Instead it has been used as a park.

Research history

Gunnarsängen was located by a group of local amateur archaeologists surveying the areas around the inlet called Kapellhamnen. Their aim was to locate Viking Age sites possibly connected to a Late Iron Age harbour in the area. In a park with meadow-like vegetation, north of an area with detached houses, they found some bronze artefacts and a few pieces of ceramics. Most of the finds can be dated to the Late Iron Age. These results inspired them to continue but even when they opened a larger trench (about 25 m^2) their work did not give any further results (Fagerström & Roth 1999).

Due to these finds, and a project called *Our Maritime Heritage* at the Archaeological Department of the University of Helsinki, the site was surveyed once more (Jansson 2005). Gunnarsängen was considered an archaeologically interesting site due to the earlier finds, historical records, topography and the location of the site. The first season of excavations were therefore undertaken in the year 2003 (Trench A) around the place where the amateur archaeologists made their discoveries (Fig. 2). Most of the area had been a field for growing potatoes up to the 1970s and the modern deep ploughing had disturbed the sediments. Only in the lowermost layers could more or less *in situ* finds be made for credible interpretations. In trench B, the remnants of a well preserved burnt building, which has been dated to the late 17th or 18th centuries by the archaeological material, was located (Jansson 2004). One possibility is that the building had been burned in August 1788 when the Russian Navy plundered several villages in the Hanko peninsula (Nikula 1938: 208–9).

During the first season, two small shards of possible medieval stoneware were found in a test pit in the northern part of the site. Therefore, it was decided that the site would be given a second chance. During the next season, Trench C was opened on the western side of a low and small bedrock elevation. Furthermore, a smaller Trench D was opened on the eastern side of this same elevation. During this season, the results were more encouraging. In Trench D, a black, very greasy layer was discovered straight under the thin topsoil. In that layer, there were no recent finds or finds from modern times. The layer appeared to be an intact medieval layer and therefore Trench E was opened around it in the season of 2005. Most of the area revealed the same medieval layers under the topsoil as the year before. In this article, the trenches D and E will be combined and labelled E(D), because they are basically the same area.[2]

THREE YEARS OF EXCAVATIONS AND A LITTLE MORE

The archaeological record

Gunnarsängen had a very shallow vertical stratigraphy. The deepest cultural layers were encountered in Trench A (depth 0.50m ± 0.20m) in which they resulted from intensive plowing and mixing of the sediments. In the other trenches the depth of the layers varied between 0.20–0.30 m in thickness before mineral sand at the bottom of each area. The sod at the site was mostly only 0.10 m thick.

The sediments in all trenches, except Trench E(D), were disturbed and consisted mainly of a layer of sod, with a sandy organic soil underneath and straight under a bottom layer of mineral sand. In Trench C, a main factor affecting the stratigraphy was probably closeness to the farmyard of the 17th–18th century farm located earlier in Trench B. This made it impossible to conclude from which context, medieval or later, all the bone material and other non-diagnostic finds were from. The diagnostic artefacts from these areas have been used for analysis because it can be assumed that

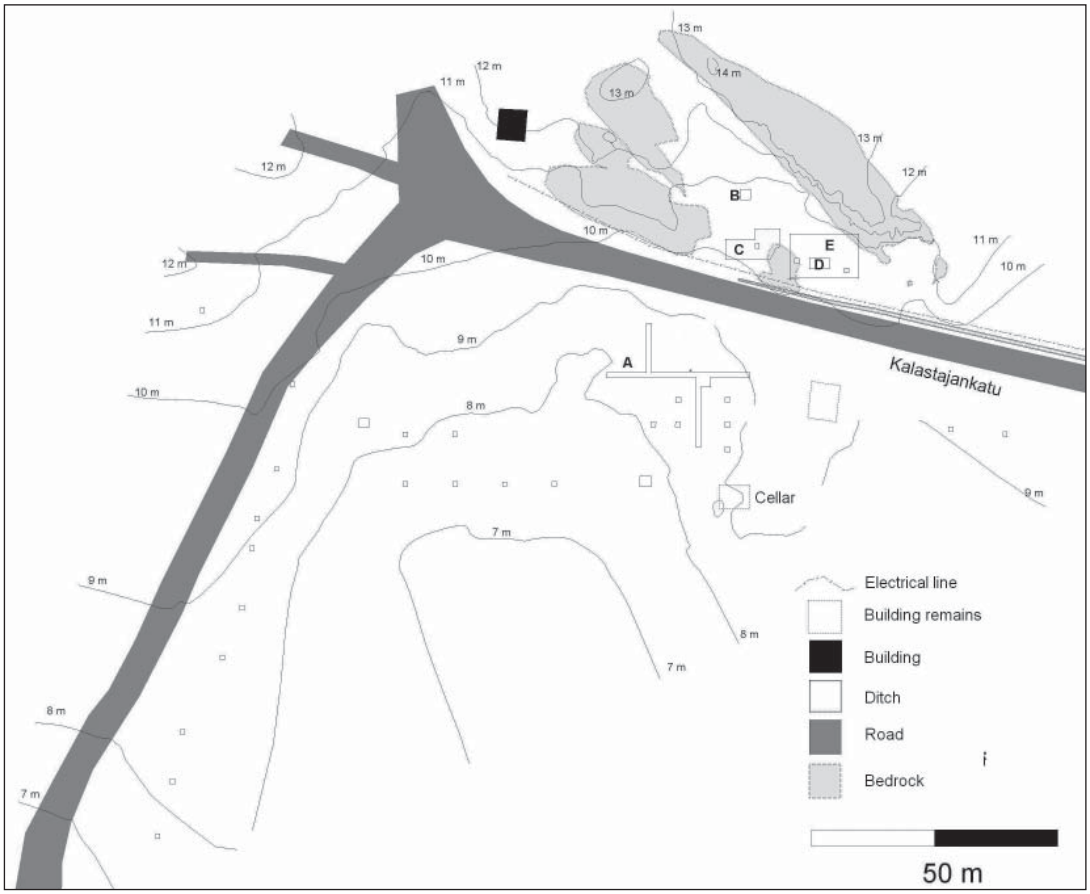

Fig 2. Map of the trenches and areas excavated 2003-2005.

the artefacts were probably more or less in their original area. This can be assumed because in the area no evidence of erosion or accumulative processes could be observed. The area had furthermore not been ploughed during modern times and even if this would have happened it would have been possible to relate the finds to their original area (cf. Schofield 1991).

In Trench E(D), the black, resilient layer under the sod was very rich in finds, especially burnt pieces of clay and especially the southwestern area also of bones. It also consisted of large amounts of soot and charcoal, which indicates that there had been some burning in the area or soot and charcoal had been brought there as household refuse.

Horizontally, the most complex stratigraphy was observed in Trench E(D). The distribution of artifacts (see below) indicates different activity area that correlates with the structures observed. Just under the top soil, a foundation for a road, built by small cobbles, was located. The road is visible on a cadastral map from the mid-19th century and consisted of two parallel running depressions that could still be seen in the layer underneath. Just east of the road in the south part of the trench, a pit had been dug and filled with crushed bricks, potsherds and twigs. This was probably done when the road was built in the 18th–19th centuries or later, in order to even out the surface and sewer the otherwise damp area. The dampness was observed because during the field season the area remained damp and wet even if the summer of 2005 was very dry.

In general, it can be said that Gunnarsängen is both an uncomplicated and a challenging site to study. It is uncomplicated because the structures have not been rebuilt or heavily reused and represents a short period. On the other hand, all remnants and features are vertically 'packed'

close together and often partly mixed because of the very thin vertical stratigraphy. Very careful excavation techniques are needed to study these types of sites. This might be possible in a research project but not necessarily in, for instance, a rescue excavation with a strict schedule.

Structures and features

In Trench A, no visible structures could be found due to the mixing of the sediments. The only distinguishable feature was the remnants of a layer of charcoal that was located between the ploughed layer and sterile bottom sand. It could be originally from the initial burning and clearing phase of a field in the area.

A structure was located in Trench C which consisted of a rectangular area where fist-sized and smaller stones had been packed into a single layer with an even surface which was preserved in an area of 3.50 x 2.10 m (E–W x N–S). The eastern edge was laid against the bedrock elevation. In the northeastern corner, also against the bedrock elevation, there was a simple fireplace dug into the sand (diameter 1.20 m, depth 0.50 m) with a few heavily burnt cobbles against the bedrock. In the depth of about 0.30 m, the layer inside the fireplace turned completely into charcoal and some large parts of charred tree were collected for analysis.

In the southern part of Trench C, there was a pit formation dug into the bottom sand. Some stoneware was collected in the bottom layers of this pit, but the dating of this structure is unclear because the entire filling layer was mixed.

In Trench E(D), the structures and features were possible to locate only after removing most of the black, resilient and hard layer, which is dated to the Middle Ages. Underneath it, in the northern part of the trench, crossing streaks in the mineral sand were located and interpreted as remains of ploughing. The crossing pattern indicates that the tilling of the soil was done with a plough (Myrdal 1985: 95–6; Gren 1997; Orrman 2003: 46). This is indicated also by the fact that in the northern corner of the field most of the plough marks make nearly 180º turns almost on the spot, which would not been possible with a plough. The best preserved area is the northern part of the field. There the marks are between 5–10 cm wide and they penetrate the mineral sand to a depth of 5–10 cm. The southern part of the field is in its western part disturbed by contemporary or later medieval activity and in the eastern part by the modern activity described above.

The area with the plough marks was bordered in its north and west part by a ditch (about 0.40–0.50 m wide and 0.40–0.50 m in depth) that had at some stage been filled with a stony layer of sooty, black soil. In the northeastern part, the plough marks were not that clear but from the extent of the ditch it is clear that the field has continued towards south and east of the trench. In 2006, when the area towards south was excavated, a bedrock elevation was found. This has been a natural border of the field. Eastwards of the elevation there was a ditch running from the ditches bordering the field. The area of the ancient field has been only about 7 x 15 m or about 100 m^2.

The most complicated and versatile area was the southwestern and western part of Trench E(D). Based on stratigraphic observations, it has been interpreted that the field originally also reached to this area. The ditch around the field ended in the bedrock elevation and some remnants of ard marks were observed under the cultural layers in the southwestern corner. At some stage the ditch was directed in a new direction in its western part. It was curved inwards and at the end of the new ditch a posthole was located. Two 0.20 cm wide, shallow furrows continued from the posthole, one to the east and the other to south in 90º relation to each other. Two more postholes were located in the eastern part, in north–south direction from each other. In a hollow in the bedrock elevation, forming the western border of the area, a hearth or the base of an open rock stove was located.

The ‘packing’ effect described above makes interpretations of the southwestern part of Trench E(D) challenging. The layers on top of it were considerably harder and resilient than in other part of the trench, which made it harder to excavate. Typical for this area was also a clear concentration of burnt clay and bones all packed into the same resilient layer. Negative marks of branches and also straws can be observed as also negatives of seeds in many of the pieces of burnt clay. An interesting feature was that pieces of wood were found and excavated in the area. Part of these was fragments of boards, some about 0.25 m wide with the surface preserved while the rest of the wood hade decayed. The rest were remnants of round laths, about 0.05–0.10 m in diameter. All the wood was at least partly burnt. Also chunks

and areas with unburnt clay were found. These were always located directly under the boards and on top of the mineral sand.[3]

Ceramics

In Trench A, no medieval ceramics were found but under the ploughing layer, against the mineral sand at the bottom, some very coarse ceramics were located. These were concentrated more or less around the original find place. The rims are unprofiled and the ceramics were burnt in a low temperature. This is typical for later Iron Age sites in Finland (Kivikoski 1973).

In Trench C, the only identifiable pre-modern find category was shards of stoneware. The provenience of the larger part of the 56 pieces of ceramics is Lower Saxony and consists of stoneware dated to the late 13th and early 14th century. One piece with a depression on the rim is from a bowl produced in the final decades of the 13th century (Stephan 1982: 95–7; 1983: 104–6; Pihlman 2003: 197–9). One piece of Siegburg stoneware was also collected (Stephan 1982: 103–7; 1983: 99–102; Gaimster 1997: 163–7; Pihlman 2003: 197–8).

In Trench E(D), the main diagnostic find category was Baltic ware ceramics. There were 28 pieces of this type in total. All the diagnostic pieces are very homogenous in color and structure, of the type called north-western Russian type 3:3. The type was produced during the later part of the 13th century onwards with the main period of production being the 14th century (Tvauri 2000: 104–5). In this area also some Siegburg stoneware, among them a rim from early and middle 14th century, were found (Stephan 1982: 103–7; 1983: 99–102; Gaimster 1997: 163–7; Pihlman 2003: 197–8).

Other finds

Three coins were collected. They are all Swedish coins minted by King Magnus Eriksson during the 1320s to 1340s. Also an iron fishing harpoon and lead net weight are worth mentioning. The rest of the metal finds consist of two buckles, boat rivets and nails. Of the other find categories, three glass beads should be mentioned. Two of them are blue and quite small, while one is a little larger (ca. 7 mm in diameter) yellow bead with circular decorations. All three beads have heavily worn holes. In the bottom of trench C a piece of raw amber was collected.

^{14}C datings

So far only three ^{14}C datings have been made, all of the samples deriving from Trench E(D). The datings come from two grains of barley and one of oat. The younger date is of the oat grain (cal. AD 1290–1420, 2 sigma). The two dates from barley, of which one comes from the field and the other from a ditch, are both showing a strong dating to the 13th century (cal. AD 1150–1280, cal AD 1190–1300, 2 sigma). Based on these datings, the site seems to be in use between the early or middle of the 13th century and late 14th or early 15th century, but more datings are obviously needed.

The osteological material

The osteological and paleobotanical material discussed here derives only from the season of 2005. This is due to the fact that during the earlier years there was no contexts good enough for sampling or analysing bone material. The exception for this is Area D which is included in the 2005 material because it was completely inside the site of that year.

Only the bone material excavated in 2005 was investigated. The bones originate in the building and the field in Trench E(D). The material was identified by using the bone collections in the Finnish Museum of Natural history (University of Helsinki) as reference material.

The bone material from Gunnarsängen is mostly burnt and fragmented, but occasional unburned bones are present (mainly tooth or enamel fragments). Burning seems to be uneven and the color of the specimens varies from black to grey or white. The identification level is very low due to severe fragmentation. Only about 13 % of the bone material could be identified to species, genus, family or class level (Table 1).

A total of 932 bone or tooth fragments were identified**.** A majority (89 %) of these are from teeth, mainly enamel of domestic animals (cattle *Bos taurus*, sheep/goat *Ovis aries*/ *Capra hircus* and pig *Sus scrofa domesticus*). None of the fragments from sheep and goat allowed the species identification. A number of tooth fragments could only be identified to large herbivore (*Ruminantia*). The possibility is thus not excluded that some

of the enamel fragments could belong to European elk (*Alces alces*). The rest of the identified fragments belong to wild mammals (grey seal *Halichoerus grypus*, ringed seal *Pusa hispida*, mountain hare *Lepus timidus* and otter *Lutra lutra*), fish (pike *Esox lucius*, cod *Gadus morhua*, perch *Perca fluviatilis*, cyprinid fish Cyprinidae) and birds.

The distribution of skeletal elements of domestic animals is presented in Figure 3. Both meaty and non-meaty parts of skeleton of domestic animals are present in the material. The fragmented state of the tooth fragments does not allow age determination, but it seems that most of the cattle tooth fragments do not belong to old animals (teeth were not heavily worn). This may indicate that cattle were kept for meat. A fragment of pig deciduous premolar tooth (dp2/dp3) indicates that animals were slaughtered under about 12–14 months of age (Hillson 1986). One complete and unburned horse tooth is present in the material. It was found in a mixed stratigraphic layer so it is not known if it actually derives from the settlement area.

Both grey seal and ringed seal were identified in the material. The identified seal bones derive from skull, vertebra, legs and feet (Fig. 4). One identified bone fragment from otter derives from ankle (*calcaneum*). The only bone from mountain hare is from foot (*metacarpus* or *metatarsus*). Bird bones derive from shoulder, wings and legs. Fish bones derive from head region, teeth and vertebrae. The minimum number of individuals for all species is one, which apparently is affected by the high level of fragmentation.

Table 1. Identified animal taxa from Gunnarsängen.

Taxon	NISP	MNI
Pig (*Sus scrofa*)	20	1
Cattle (*Bos taurus*)	121	1
Horse (*Equus caballus*)	1	1
Sheep/goat (*Ovis aries*/*Capra hircus*)	8	1
Unspecified Ruminantia	669	–
Unspecified Mammalia	76	–
Mountain hare (*Lepus timidus*)	1	1
Otter (*Lutra lutra*)	1	1
Grey seal (*Halichoerus grypus*)	4	1
Ringed seal (*Pusa hispida*)	3	1
Unspecified seals (*Phocidae*)	14	–
Ducks (Anatidae sp.)	6	–
Unspecified bird (Aves)	8	2
Cod (*Gadus morhua*)	2	1
Pike (*Esox lucius*)	4	1
Cod/Pike	1	–
Perch (*Perca fluviatilis*)	1	1
Cyprinid fish (Cyprinidae)	1	1
Unspecified fish (Teleostei)	4	–
Total	958	

Key: NISP= Number of identified specimens, MNI= Minimum number of individuals. Unspecified Mammalia includes undetermined fragments of cranium, teeth, ribs, vertebrae.

Eight fragments of bone artifacts were recovered. Two are fragments of a possible harpoon. They are from a long bone of some large mammal, most likely cattle or elk. Other modified fragments are from smaller, elongated artifacts, probably fish hooks. One of them has a groove made for binding the string near the edge. Such hooks (in Finnish *launi* or *veteli*) were typically used before the spread of the metal hooks (Sirelius 1906). All bone artefacts are burnt. Cut marks were observed in two pieces of unspecified bones. Tooth marks, probably of rodents or carnivores, were observed in one seal bone and two unspecified bones.

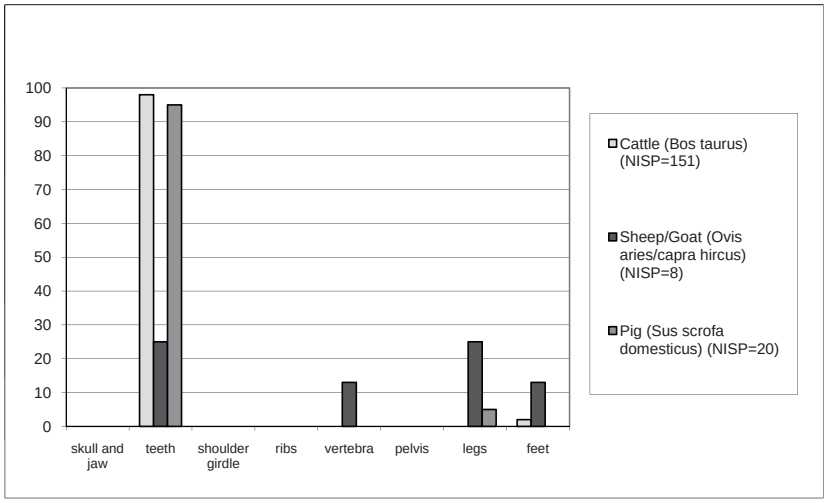

Fig 3. Anatomical distribution for cattle, sheep/goat and pig (in per cents).
Teeth =tooth, root and enamel fragments, legs= femur, tibia, fibula, feet= carpals, tarsals, metacarpals, metatarsals, phalanges.

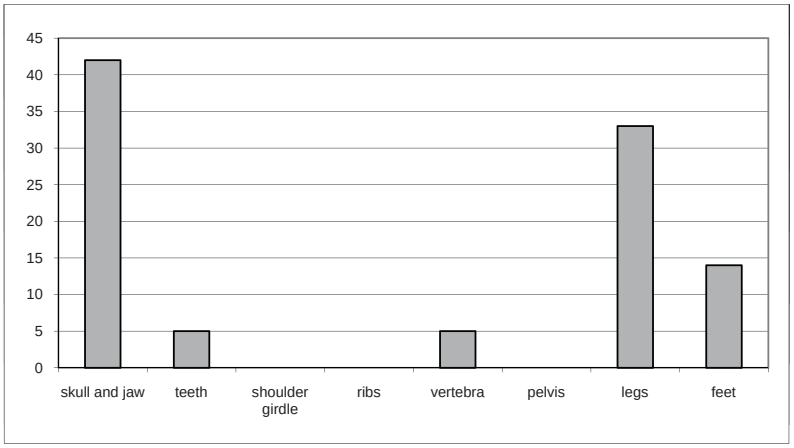

Fig. 4. Anatomical distribution of seal (Phocidae) bones in Gunnarsängen (in per cents, NISP=21).

The distribution of bones in the area is relatively even. Bones from domestic animals are present inside of the building remains as well as in the field area. Seal and fish bones were found mostly in the house area.

The poor preservation of the bone material limits its interpretation. The fragmentation of bones has resulted in a very low identification level. It is evident that due to taphonomical processes a large part of the bone material have been destroyed.

The distribution of some animal bones seem to correlate with building remains observed during excavation. It is possible that some of the bones found in the field area represent household garbage which was thrown to the field. The very uneven burning of bones suggests that the bones do not mainly derive from the hearth. Because a majority of the bones and tooth fragments were found in the same area as burnt clay, it is more probable that bones got burned with the building.

Most of the identified remains from domestic animals are from non-meaty parts, like teeth and the lower feet. Practically all cattle remains are from the teeth. However, also meaty parts like vertebral column and the upper legs have been identified from sheep/goat and pig. The reason for a high proportion of non-edible parts is most likely a result of fragmentation. Bones from meaty parts (for example the large bones from the upper limbs) are not easily identifiable in the fragmented material. Also non-meaty parts can be used in food preparation, and bones, for example metatarsalia and metacarpalia, can also be used in the production of different artifacts. It is likely that the bone material recovered at Gunnarsängen is mainly a sporadic selection of debris from consumption, slaughtering and artefacts or artefact production.

Seals composed an important part of the economy in Gunnarsängen, as judged from the relatively large amount of seal bone fragments. This is not surprising when the coastal location of the settlement is considered. The lack of remains from shoulders, ribs and pelvis of seals may be due to the preservation factors, and should not be interpreted as direct indication of butchering or other treatment of carcasses. Fragments of seal cranium were identified which indicates that seals were caught from the local area. Typically, only the most important parts of seals were brought to the settlement from long-distance hunting voyages (Talve 1996). This does not, however, exclude the possibility that also long-distance seal hunting voyages were made from Gunnarsängen. It is notable that both grey seals and ringed seals are present in the material as the ecology and hunting methods of these species are different (Ylimaunu 2000; Storå 2001). Grey seals stay mostly in the outer archipelago while ringed seals are commonly met in the inner archipelago and near the coast (Ahlbäck 1955: 170). Two fragments of bone harpoons found at Gunnarsängen are probably seal harpoons. Harpooning seals was common before the spread of guns in the 18th century (Nihlén 1927: 194–203; Leppäaho 1936; Ylimaunu 2000: 190, 261).

Otters and mountain hares were most probably hunted for their fur, but the scanty material does not allow further interpretation. Mountain hares were probably also used as food. Only one bone from mountain hare was found in Gunnarsängen,

but it is the most common wild animal in the bone samples from medieval (14th–17th centuries) Turku in south-western Finland and the castle of Kuusisto near Turku (Vuorisalo & Virtanen 1987: 223; Kylänen 2001: 23, 31). Historical sources emphasize the role of arctic hare as fur animal (Olaus Magnus 1555: 50; Ekman 1910: 164).

The few bird bones in the material indicate that fowling was also part of the local economy. The duck bones in the Gunnarsängen material could not be identified to species level, and it is not possible to say whether they derive from domestic or wild ducks. It is not impossible that domestic ducks were raised in Gunnarsängen, but it is perhaps more likely that wild ducks were caught. The settlement was situated near the breeding area of several duck species, and their hunting for household consumption has a long history in Finnish coastal areas.

Lead weights found in Gunnarsängen indicate net fishing. It is possible that nets were also used for hunting water birds and ringed seals (Ekman 1910: 252–5; Dahlström 1938; Storå 1968: 162–274; Storå 2000; Ylimaunu 2000). Fishing was practiced both near the coast and in more remote waters. Pike and perch are typical fish which can be caught with nets, traps and hooks in the inner archipelago (Sirelius 1906; 1908). Cod fishing has been practiced mainly in more remote waters, but often quite near the coast. Cod lives mostly in the basins near the bottom but is regularly observed in inner archipelago, especially during the spring and autumn (Koli 1990: 216). The main fishing method used for cods in the 16th century Finnish archipelago (Kökar) was a hook and a string (Ahlbäck 1955: 72, 109). Cod and pike (and perch) are typical species for making dry fish for storage (fish is salted and dried in the sun). Dried cod and pike have constituted an important item of Finnish trade during historical times (Ahlbäck 1955; Koli 1990: 74).

The paleobotanical material

During the 2004 and 2005 excavations, macrofossil soil samples were collected, of which 33 samples (altogether 217 liters) have been analysed. The analysis presented here includes 28 of them. Organic material was separated from the soil using saturated salt water flotation with a 0.2 mm mesh size sieve. Flotated organic material was rinsed with tap water and macrofossils were picked from the samples using a stereomicroscope. Charred plant parts were dried and the uncharred ones were preserved in 50 % alcohol. Sample information and the amount of plant parts – mainly seeds – per species are presented in Table 2. The weight of a wet sample collected from the sieve is shown in grams. General quantification rating to indicate a rough amount of charcoal and uncharred organic material – mainly roots – in the samples ranges from overwhelming presence (***) to moderate (**) and small (*). The overwhelming presence of uncharred plant material may indicate contamination from the upper layers, or recent activity at the site. The identification was done using reference material and literary references (Beijerinck, W. 1947; Latin names follow Hämet-Ahti et al. 1998).

The paleobotanical results presented in the table are grouped according to sample context in Trench E(D). The three main contexts include: *house structure*, *ditch* and *field*. The house structure in the trench is further divided into *cultural layer* (sample numbers 1, 2, 6 and 7), *post holes* (8–11) and *hearth* (3–5, 12, 13). *Field* contains samples from the *plough marks* (23, 24) and from the *field layer itself* (25–28).

Among the samples from the building, only one cereal grain was positively identified. A barley grain was found in the sample taken from the floor level. The other grains were identified only as cerealia due to their poor preservation. Two of them came from the samples of cultural layer and four from the hearth. Fire places usually offer a good sampling environment, but the abundance of charred remains can vary due to the intensity of the fire; in a hot and intensive fire plant remains burn to dust. The lack of grains can also indicate that the fireplace was used for heating only and not for preparing food.

The ditch samples yielded three identified grains of barley (*Hordeum vulgare)* and two of rye (*Secale cereale*). Six grains were so badly preserved that they could not be identified. The most numerous species is fat hen (*Chenopodium album)*. It is a weed which strongly indicates human activity. When the building of Gunnarsängen was inhabited and the field cultivated, fat hen was abundantly growing in the nearby field.

Only one grain of oats (*Avena sativa)* and one of wheat (*Triticum aestivum)* were found among the field samples. Oats was found from the plough mark, and wheat grain, probably club wheat, in

Table 2. Identified plant species from 2004 and 2005.

	DWELLING											
CONTEXT	S4	S11	S4	S4	S4	S58	S68	S60	S67	S68	S72	S3
SAMPLE NUMBER	1	2	3	4	5	6	7	8	9	10	11	12
AMOUNT (litre)	2	10	10	10	10	1	4	3	9	2	4	6
AMOUNT(grammes)	22	29	40	18	56	25	31	27	22	8	12	73
Plant species												
Cereals												
Avena sativa	–	–	–	–	–	–	–	–	–	–	–	–
Cerealia	–	1*	4*	–	–	–	–	–	–	–	–	–
Cerealia	–	1*	–	–	–	–	–	–	–	–	–	–
Hordeum vulgare	–	–	–	–	–	1*	–	–	–	–	–	–
Secale cereale	–	–	–	–	–	–	–	–	–	–	–	–
Triticum aestivum(subs.compactum?)	–	–	–	–	–	–	–	–	–	–	–	–
Weeds	–	–	–	–	–	–	–	–	–	–	–	–
Chenopodium album	–	–	–	–	–	–	–	–	–	–	–	–
Chenopodium album	1*	2*	–	1*	–	–	–	–	–	3*	–	1*
Chenopodium sp.	–	–	6*	–	–	–	–	–	–	–	–	1*
Dianthus deltoides	–	–	–	–	–	–	–	–	–	–	–	–
Dianthus deltoides	–	–	–	–	–	–	–	–	–	–	–	–
Galium sp.	–	–	1*	–	–	–	–	–	–	–	1*	–
Polygonum lapahtifolium	–	–	1*	–	–	–	–	–	–	–	–	–
Rumex acetosella	–	–	–	–	–	–	–	–	1*	–	–	1
Stellaria media	–	1	3*	–	–	–	–	–	–	–	–	–
Urtica dioica	–	–	–	–	–	–	–	–	–	–	–	–
Urtica dioica	–	–	–	–	–	–	–	–	1*	–	1*	–
Urtica urens	–	–	–	–	–	–	–	–	–	–	–	–
Urtica sp.	–	–	–	–	–	–	–	–	–	–	–	–
Natural vegetation	–	–	–	–	–	–	–	–	–	–	–	–
Anthriscus sylvestris	–	–	1	–	–	–	–	–	–	–	–	–
Arctostaphylos uva-ursi	–	–	–	–	–	–	–	–	–	–	–	–
Betula pendula/pubescens	–	–	–	–	–	–	–	–	1	–	–	1
Carex sp.	–	1*	–	–	1*	–	–	–	4*	1*	–	–
Hypericum maculatum	–	–	–	–	–	–	–	–	–	–	–	–
Juniperus communis	–	–	–	–	1*?	–	–	–	–	–	–	–
Poaceae	–	–	–	–	–	–	–	–	–	–	–	–
Poaceae	–	–	6*	–	1*	–	–	–	–	–	–	–
Polygonum sp.	–	1	1*	–	–	–	–	–	–	–	–	–
Polygonum amphibium	–	–	–	–	–	–	–	–	–	–	–	–
Rubus idaeus	–	–	–	–	1	–	–	–	–	–	–	–
Rumex sp.	–	–	1*	–	–	–	–	–	–	–	–	–
Scirpus sp.	–	–	–	–	–	–	–	–	–	2*	–	–
Stellaria palustris	–	–	–	–	–	–	–	–	–	–	–	–
Stellaria sp.	–	–	–	–	–	–	–	–	–	1*	–	–
Vicia sp.	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–
Pinus sylvestris, needle	–	–	1*	–	–	–	–	–	–	–	–	–
bud	–	–	–	–	–	–	–	–	–	–	–	1*
unidentified	–	–	–	–	–	–	–	–	2	2	–	–
unidentified	–	–	2*	–	–	–	–	–	–	–	3*	–
sclerot.	*		**	–	–	***	–	–	**	***	**	**
charcoal	***	*	**	*	***	**	***	**	*	***	**	**
organic material	–	***	–	***	*	**	–	***	***	**	*	**
Insecta	–	*	–	–	–	–	*	–	–	–	*	**

*after the number refers to charred plant part.

the plough layer. Two grains of barley and one grain of rye were also identified.

Altogether 185 plant remains were collected, of which 121 were charred (marked in the table with a star). Due to the acidity of soil and the prevailing climatic conditions in Finland, it is most likely that only charred plant parts would have been preserved from the periods of ancient human activity at the site. Thus uncharred plant remains are mainly seen as modern contamination, with one possible exception. The bottom of the ditch could have provided suitable water-

		DITCH								FIELD					
S6	S15	S15	S15	S16	S62	S65	S15	S15	S3	S14	S16	S4	S4	S4	S4
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
7	8	10	4	4	2	2	10	2	2	10	2	8	4	2	11
366	21	116	20	29	24	7	182	12	76	126	7	34	41	8	72
–	–	–	–	–	–	–	–	–	–	1*	–	–	–	–	–
–	–	–	–	–	1*	–	–	–	5*	1*	1*	–	–	–	2*
–	1*?	–	–	–	–	–	2*	–	–	–	–	–	–	–	–
–	–	1*	–	–	–	–	1*	–	1*	1*	–	–	1*	–	–
–	–	1*	–	–	–	–	1*	–	–	1*	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1*
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
–	1*	2*	1*	8*	–	–	3*	1*	–	2	–		1*	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–
–	2*	–	–	1*	–	–	–	–	–	–	–	–	–	–	–
1	–	1*	–	–	–	–	2*	–	–	2*	–	–	–	–	–
	–		–	–	–	–	–	–	–	1*	–	–	–	–	–
1	–	1*	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	2*	–	–	–	–	–	–	–	5	–	–	–	–	2
–	–	–	1	2	–	–	–	–	–		–	–	–	–	–
–	–	–	1*	–	–	–	–	–	–	1*	–	–	–	–	–
–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
–	–	–	1*	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	1*	–	–	–	–	–	–	–	–
–	–	–	–	1	–	–	1	–	–	–	–	–	2	–	–
–	1*	1	–	–	–	–	–	–	–	–	–	–	2*	–	1*
–	–	–	–	–	–	–	–	–	–	3	–	–	1*	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–
–	–	–	–	–	–	–	1*	–	–	1*	–	–	–	–	1*
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	1*	–	–	1*	–	–
–	–	–	–	–	–	–	–	–	–	–	2*	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	3	–	2	–	–	–	–	–	–	5	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	1*	–	–	–
–	–	–	–	1*	–	–	1*		2*	–	–	–	–	–	–
–	3	–	–	–	–	–	–	1	3	–	–	–	–	2	–
–	–	–	–	–	–	–	1*	1*	–	2*	–	–	2*		–
**	**	**	**	**	–	–	**	–	–	*	–	–	*	–	–
***	*	**	*	**	**	*	***	**	**	**	**	*	**	*	**
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logged conditions where plant remains could have been preserved uncharred.

As to charring itself, it may have been an effect of natural phenomena (such as spontaneous fire) or human agency. Considering the type of plant species found and the context of discovery, it is proposed here that a majority of the samples were handled by humans, and that their charred state resulted from some kind of human activity. Macrofossils found in the dwellings have most probably been charred in the hearth located there. It is also possible that plant remains were burnt

when the building was destroyed by fire. Probably, the plant remains found in the postholes were deposited together with the fill of the holes during the construction (already charred or not), or they could have become charred during the fire which destroyed the wooden structures. Alternatively, these seeds, already charred (during the destruction of the building?), were naturally redeposited into the postholes during the post-occupational periods. As to the finds in the ditch, these could have been disposed of as rubbish from the building or naturally deposited there together with the material from the fields, washed in by rainwater. If it derived the field, the sample was most probably charred *in situ* when straw was burned to fertilize the field. Such charred samples might also have been naturally dispersed in the field along with the ashes from fireplaces.

Generally, the three contexts mentioned above do not seem to differ noticeably from each other. In all of them charred plant remains are more numerous than uncharred and cereals and weeds outnumber natural plants. None of the species identified is abundant. In more detailed examination, slight difference between contexts can be seen. When the number of charred cereals and weeds are divided with liters of soil analysed, the ratio is bigger in ditch than dwelling and field. Dwelling and field samples come very close to each other, with 0.38 and 0.37 charred seeds per liter, while the concentration is 0.93 in ditch samples.

Floorboards found in the excavations and described above were poorly preserved; they were very soft and flaky. They were identified in the Botanical Museum in the University of Helsinki. Identification was done using the cell structure which was very fragmentary. Wood used for floorboards was most probably spruce (Tuuli Timonen and Pirkko Harju, pers. comm.).

DISCUSSION

Chronology of the site

At Gunnarsängen, the C^{14} datings seem to date the site mainly to the 13th and 14th centuries. Additionally, two categories of finds are particularly useful for dating the site: silver coins, dated to the middle of the 14th century, and ceramics.

The ceramics from the site consist mainly of three categories: local Iron Age ware, Baltic ware and stoneware. The coarse Iron Age ware is assumed to be a household ware, which is mostly undecorated and which comes into use after the Roman Iron Age and stays in use to the end of Iron Age (Kivikoski 1973). The Baltic ware on the other hand points to the late 13th or 14th century. It is interesting to note that all diagnostic pieces of these ceramics represent the same type. The material is so homogenous that the pieces originate from only a few vessels. This makes it difficult to use the Baltic ware for dating purposes; it is possible that it represents only a temporary or very short period of occurrence, and it can even be from a single event only.

The stoneware represents at least 6–7 different vessels based on the type of material, glazing and form. Several types of ceramics were clearly brought to the site in either several occasions over a longer period or in a few occasions over a shorter period of time. A few years ago, a wreck found in Egelskär in the archipelago Finland proper was dated to the late 13th century, and its cargo of ceramics includes some vessels of a similar type as those found at Gunnarsängen (Alvik & Haggrén 2003; Wessman 2007; Tevali 2010)

The dateable material suggests that Gunnarsängen had its first visitors during the Late Iron Age and a permanent settlement probably around the middle of the 13th century at the earliest. The possibility of an Iron Age settlement, however, cannot entirely be excluded; a few finds of ceramics from the southern part of the area might point to an earlier inhabitation. The stray finds on around the peninsula are mainly dated to the Viking Age, which indicates that the area was used at least as a landing area for ships 300-500 years earlier.

The ceramics in particular suggests that the settlement continued up to the late 14th century, but the settlementat Gunnarsängen was abandoned in the early 15th century at the latest. We do know from recent studies that no other medieval settlements are found in the neighbouring area (within about 100 m radius), but we do not know what the situation is at the other farms in the hamlet that can be observed in the 1647 map.

Two buildings with different function?

The easiest distinguishable activity area comprises of the building remains in Trench C. The rectangular layer of stones with a hearth in the southern corner can be interpreted as a building

sill with an open hearth. The dating of the structure is unclear because the ^{14}C datings from the hearth are still missing. The 13th and 14th century stoneware found in the mixed layer above provides some indication the age of the structure, but it has to be verified by absolute datings. Some similarities can be pointed with the house structures at the Olustvere settlement in Estonia. It is possible, albeit not likely, that the hearth-like structure is the foundations of a stove where only the lowermost part has preserved. It is not very common for a stove, at least with an open hearth, to be located in the corner of the building (Lavi 2005: 133)

The building remains in Trench E(D) are somewhat more complicated to interpret than the building remains in Trench C because of the destruction of its eastern part and other activities nearby and partly on top of it. The evidence for an existence of a building there comprises of the post holes, shallow furrows in 90º angle in relation to each other (which are probably the remains of a timber foundation), and the fireplace against the bedrock elevation. One indication of a possible building is also the spatial pattern of burnt clay with negatives of mostly branches and grasses, but also seeds, and burnt bones that form a rectangular concentration in the same area. Also the layer of clay and wooden boards, possibly floorboards on a clay founding layer, supports the idea. The laths, mostly positioned vertically in the sandy bottom layer at the edge of the structure but also scattered inside it, could be remnants from the wall or ceiling. At some point the building has burnt down, which is seen by the partly burnt wooden structures, partly burnt bones, and the large amount of burnt clay. The wooden parts were probably preserved because of the very dense, hard packed layer consisting of large amounts of clay and bones mixed with sooty silt above it.

What was the function of the building in Trench C is a more difficult question to answer because of the lack of intact layers. Looking at the distribution of the ceramics can give some clues about function of the house structures. There is a clear difference in the spatial pattern of the stoneware and the Baltic ware ceramics. All the stoneware ceramics, except for ceramics from Siegburg that were all found in the uppermost layers of trench E(D), were found in Trench C, mostly in its southern part. Those that were found in Trench E(D) were all located in the north-western corner outside the field and building structure there. The Baltic ware on the other hand could only be found in Trench E(D), and predominantly in the lower layers of the building and field area. The assumed use of stoneware as storage vessels and tableware indicates that the building remains in Trench C actually represent a house.

Typologically, though, the ceramics in Trench C and E(D) should be more or less contemporaneous with each other, but that cannot be verified yet due to the lack ^{14}C dates in Trench C. If the building remains in Trench C are contemporaneous with the ceramics, it can be interpreted that the spatial pattern of ceramic finds indicates a difference in function between the two buildings. The building remains in Trench C would thus be an area of storage or occupation because all the stoneware, except for three pieces from Siegburg, was found in that area. The Baltic ware in the eastern part would be pointing towards household activities because the low tempered ware was suitable for food preparation while stoneware was not, which is also shown on the large number of shards with a thick layer of sooth on their outer surface.

There is also other evidence of a household function of the building in Trench E(D). For instance, the high concentration of bones combined with a greasy thick sooty layer and a hearth or stove in the western part of the building is a strong indication of food preparation. Interestingly, the seal bones show a slight concentration to the area of the building. This could indicate that the building was used for treatment of seals or seal meat and blubber. The number of identified seal bones is quite small, though. When combining all the evidence, it is very likely that the building was used for household activities, with a use for butchering and preparing food products being most probable. Separate kitchen buildings are known from the Finnish archival material at least from late Middle Ages.

Agriculture at Gunnarsängen

The collected data of plant remains from Gunnarsängen is not large, but it is typical for an early medieval settlement with a building and a small field nearby. All four cereal species, barley, rye, oats and wheat, are present, barley being the most numerous of them. Barley was the most important cultivated cereal in Finland in prehistoric times,

and evidently still at the time when Gunnarsängen was inhabited.

The dominance of barley correlates with the information based on the 16th century tithes records. After 1559, the villagers began to pay their tithe in fish instead of grain. Beginning in 1560 each peasant paid one barrel of fish – perch, cod or Baltic herring – as his tithe (KA 3182).

The earliest traces of cultivation in Finland, as indicated by pollen samples, are dated to the Neolithic period 4800–4000 cal BC (Mökkönen 2010: 9). The oldest barley grain comes from a dwelling site in Niuskala, Turku, and it is dated to the Early Bronze age (1700–1300 cal BC) (Vuorela & Lempiäinen 1988: 40–41). In the medieval times, rye cultivation was already well established in southern Finland, as was the cultivation of bread wheat and oats. Club wheat was widely cultivated in southern Finland during the Iron Age, but its cultivation declined in the medieval times when it might have grown together with barley and bread wheat (Lempiäinen 2003: 327).

A great variety of weeds grew in the field, in highly nutrient-rich soils on the courtyard, and in the garden. Common nettle (*Urtica dioica)* and small nettle (*Urtica urens)* grow typically by the compost and goosefoot (*Chenopodium)*, knotgrasses (*Polygonum)*, common chickweed (*Stellaria media)* and sorrel (*Rumex)* on stumped ground. Maiden pink (*Dianthus deltoids)*, bedstraw (*Galium)* and Imperforate St John's-wort (*Hypericum maculatum*) may have been transported from the meadow together with meadow grass, possibly as fodder for animals.

As to the probable ancient farming grounds in Finland, signs of cross-plough marks (Fig. 5) had been identified at 11 sites before 2007, excluding one site on the Åland Islands, but only six of them are undoubtedly ancient field sites. Three of those have been radiocarbon-dated to the middle or later Iron Age, whereas three have been dated to the Iron Age on the basis of stratigraphic analysis. Only four sites have been subjected to a rigorous macrofossil analysis, and at four sites samples have been taken from plough-marked deposits. In Rapola Matomäki, barley was the most common but rye, oats and bread wheat were also identified. Wheat was dated there back to AD 1020–1220 (Vikkula et al. 1994). In Yläne Kappelniitty, barley and club wheat were cultivated, and wheat was dated back to AD 745–945 (Kankkunen 1994.) The Maalahti Kalaschabrannan site yielded evidence related to intensive farming, with barley being the most numerous among the identified species (Liedgren 1991). In Mikkeli Kihlinpelto site in eastern Finland, barley was most common but also club wheat was grown there. The six phases of active prehistoric field farming at the site range from the time before AD 800 to around AD 1200 (Mikkola 2005).

Seasonality of hunting and fishing

The identified animal species indicate a year-round occupation at Gunnarsängen. The best time for fishing pike with hook is during the warm period of the year, and especially the late summer (Sirelius 1906: 84). The spawning season in the summer is also a good time for catching pike. In Kökar (Åland), the largest catches of cods were taken in the end of July and in the beginning of August (Ahlbäck 1955: 109). Harpoons were used in hunting seals on the ice during the late winter (Ylimaunu 2000: 194, 260–8). In general, the most productive season for hunting grey seals was the late winter and early spring when grey seals could be hunted on their breeding ground on the ice (Ahlbäck 1955: 189). Most water birds living in Finland are migratory which means that they are absent during the winter. In Gunnarsängen, fowling was most probably concentrated in the spring and early summer when breeding birds are available in the surroundings of the settlement. Fur animals are usually hunted in the winter when fur is in its best quality. The white coat of mountain hares has been particularly significant merchandise in the medieval times (e.g., Olaus Magnus 1555: 50).

Subsistence, economy and the environment of Gunnarsängen

The settlement at Gunnarsängen shows a clear pattern of a mixed economy. The small area of the field, which the 2006 excavations revealed to be only about 150 m^2 in size, raises a question about the importance of agriculture in relation to other subsistence strategies. It is, of course, probable that the farm had several small fields used in early rotation, but looking at the total area possible for agriculture, even if not taking into consideration the need for good meadows for hay production, the total area was not probably very large. This is supported by the tax records from the 16th century and later cadastral maps.

Fig. 5. The field uncovered in area E(D) with ard marks. The excavated building was located in the area of darker soil next to the bedrock.

The specific combinations of different subsistence strategies probably varied over time due to various external factors, such as taxes, climate, trading possibilities, or internal factors, such as ownership, amount of active farms, and technology. A quantitative comparison between wild and domestic animals is not possible due to poor preservation of the material. Cattle, pig and sheep or goat may have had an important role in the food economy by providing meat, milk, and so forth, and the bone material indicates that cattle dominated. This correlates well with the information concerning animal husbandry mentioned in the 16th century tax records. The fragmented state of the teeth fragment does not allow age determinations. But it seems that most of the cattle teeth were not (heavily) worn (they do not belong to old animals), which may indicate that cattle was slaughtered for the meat in a fairly young age before producing milk.

Hunting and fishing probably played an important role in the economy, as is shown by the bone and other find material. It is probable that fishing was more important in the food economy than evidenced by the bone material because of the poor preservation conditions. The importance of fish seems logical because the site was located close to the sea. Fowling complemented the local subsistence. The seasonal indications inferred from the osteological material propose that the hunter-farmers of Gunnarsängen had settled down for year-round occupation. This also suggests that economy must have been diverse.

Almost all species identified at Gunnarsängen could have been eaten and hunted for the household use (with the exception of otter), but wild animals and especially fish were also most likely important trading items. Wild mammals, such as otter and arctic hare, were hunted for their furs. Seals were most likely hunted for their furs and for train oil. Trading of furs, dry fish and train oil may have been an important part of the economy. This is also shown by the large amount of imported ceramics that is unusual in rural Medieval sites in Finland. It is logical that the inhabitants of Gunnarsängen with trade, given the location of the site near the main trading water route from Sweden to Reval and Novgorod. Gunnarsängen was, and still is, located near a very sheltered natural harbour, Kapellhamnen, which also has a medieval chapel on its shore. Probably this chapel served both the inhabitants in Hanko, and the seafarers passing by the site could probably also benefit in different ways by cooperating and trading with the inhabitants at Gunnarsängen.

CONCLUSIONS

The possibilities that the written sources can offer when analysing the livelihood of medieval and early modern inhabitants of Hanko – as well as in every other Finnish settlements – are rather limited. We can get some base information but can not make deeper analyses in a single hamlet. Detailed information from each farm can be obtained only from 1540 onwards. Fortunately modern archaeological research offers us much more possibilities for gaining information.

The first occupants of Gunnarsängen came probably already during the late Iron Age but the permanent settlers settled at Gunnarsängen in the 13th century. From the archaeological research a preliminary picture of a farm and its economy and everyday life during approximately 200 years and about 250 years before the land register have been possible to create. The picture of a farm changing its environment to fields and indirect to meadows and grazing land is emerging. When the farm at Gunnarsängen was in existence it consisted of several buildings, how many we do not know. The excavations show that buildings were built for different purposes as in other sites in Scandinavia from this time.

The subsistence strategies seem to be well adapted to the maritime environment. This was also seen in the later tax records when tithe taxes were paid in fish from 1560 onwards. The field at Gunnarsängen is small as was common in the historical records. Therefore fishing, hunting and raising animals was of a large importance. The origin of this adaptation is seen already in the Gunnarsängen material. During the early Middle Ages the farmers still grew all four cereal species but in the 16th century they had given up wheat and oat.

Other interesting connections between the historical records and the earlier archaeological material can be observed. The farmers in Hanko paid their *bol* tax in relatively high ratio of currency compared with other *bols* in the parish. This is probably a result of trading that is very logical when looking at the location of Hanko and its known function as an important harbour. The trade can be seen in the material from Gunnarsängen. The importance of seal hunting is an indication of this and so is hunting otter and arctic hare. Also fish could be used for trading. It is probable that the ships passing by needed assistance in the form of e.g. lodging, repairs, food, water and possibly also piloting. Most likely the inhabitants at Gunnarsängen used this need as an opportunity for commerce as they did later. This is shown by quite a large amount of stoneware, amber and the glass beads compared to other rural sites in Finland.

Several connections between the situation seen in the historical record and Gunnarsängen archaeological material can be observed. The inhabitants used the possibilities that the maritime environment offered them and on the other hand they adapted to its restrictions. It is interesting to notice that we now understand more of how the inhabitants did this from the early archaeological material than we know from the later historical record.

In the late 14th or early 15th century it seems, in the light of the material analysed so far, that the farm was deserted. Why this happened will probably always be lost in the fog of time. This is a time of desertion of farms and villages all over Europe and in Uusimaa too (Haggrén et al 2003). It do not necessary have to be anything dramatic, though. It could only mean that the farm was moved to a more suitable place that can be lost for us because of modern expansion of Hanko. This is on the other hand still subjected to active research.

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NOTES

[1] In 2006 to 2009 there have been excavations on two other sites in the Hanko village: in 2006 at Kapalbacken or the site of the ancient chapel and in 2007 as well as in 2009 at Lapsen Puisto or at the site of one or two further medieval farms in Hanko village.

[2] In 2006 a rescue excavation was made in the Gunnarsängen area. An about 2–3 x 130 m large area on the northern side of Kalastajankatu was researched. The trench F was southwards from the trench C, the trenches G and I were southwards from the trench E(D). A fourth trench was opened on the south eastern side of the trench I. Only modern and/or natural layers were found from the westernmost (H) and the easternmost (K) trenches.

[3] In 2006 some poorly preserved remains of two or three further house foundations were found from trenches G, I and J.