TEIJA ALANKO* & MIA LEMPIÄINEN-AVCI**

- * University of Turku, Biodiversity Unit
- ** University of Turku, Biodiversity Unit
- ** University of Stavanger, Archaeological museum

Planted, Designed and Managed Landscapes

A Review of Finnish Garden Archaeology from an Archaeobotanical Perspective

ABSTRACT: Garden history has primarily been studied in Finland through historical sources, with archaeology playing a lesser role, although its importance has been noted. The aims of this paper are to review garden archaeological research in Finland in the context of garden archaeology and garden history research in general, to demonstrate a selection of research methods in garden archaeology, and to present research results from the 19th century garden in Lahti in Finland. A garden is here defined as a bordered and cultivated area forming a specific ecological system, specific to the culture in question. Gardens have been reflections of their eras, economic situations, and climatic periods. They have influenced and been influenced by political power, the development of science, journeys of exploration, and globalisation. Many different historical sources, such as letters, accounts, maps, and paintings have been used to study garden history. Methods used in garden archaeology include non-destructive techniques, excavations, and various scientific methods. Although the Finnish examples of garden archaeology are limited, several Scandinavian and British examples prove that archaeology can be significant in garden history studies and the restoration of historic gardens. For example, evidence of gardening was found during archaeological excavations in 2013 at the historical village of Lahti in Finland. During these excavations, a vegetable garden with intact planting beds was found. The planting beds were studied archaeobotanically, but the results did not reveal either plant residues or visible fertilizers. The lack of information, concerning especially the oldest garden sites, presents a challenge for comprehensive interpretations. The problem could be solved at least partly through archaeological and archaeobotanical research. Garden history is such a wide field that all relevant disciplines and aspects should be involved in a collaboration to form a whole.

KEYWORDS: Garden archaeology, scientific methods, multidisciplinary, archaeobotany, Finland.

INTRODUCTION AND BACKGROUND

Garden history has been studied in Finland mainly through historical sources in the fields of history, art history, landscape architecture, botany, dendrology, and to some extent in horticultural sciences, but not that much with garden archaeological methods (Suolahti 1912; Melander 1921; Knapas 1988; Hemgård 1992; Hämet-Ahti 1992; Häyrynen 1993a; 1993b; Ruoff 1993; 2001; Rosengren 1994; 1995; Sinisalo 1997; Enroth & Kukkonen 1999; Häyrynen et al. 2001; Luppi 2001a; Lounatvuori 2004; Frondelius 2005; Väre et al. 2008). However, the importance of multidisciplinary work in Finnish garden history was noticed already in the 1990s (Hemgård 1992; Sinkkilä 1992a; Häyrynen 1993b; 2001; Rosengren 1995; Luppi 2001a), and archaeological studies in historic gardens have been carried out and reported on (Luppi 2001a; Sutinen 2005a; 2005b). Archaeobotanical research has revealed garden plant remains in Finland. Macrofossils of garden species are known from settlement areas, towns, and some rural sites (e.g. Aalto 1994; Lempiäinen 1994; 2007; Onnela 2000). Nevertheless, large garden environments have not been widely studied through archaeology, by uncovering garden structures or carrying out macrofossil or other natural scientific analyses from garden soils. More studies combining all relevant research fields would be needed to create a comprehensive understanding of past gardens and a holistic discussion of landscape studies.

The aim of this paper is to review garden archaeological research in Finland in the context of garden archaeology and garden history research in general, and to present a suitable selection of research methods in garden archaeology. At the same time, the objective is to show the advantages of a multidisciplinary approach to garden history, including the potential of garden archaeology and archaeobotany. Lastly, the research results of a recent case study from Lahti in southern Finland, revealing 19th century garden structures, are presented.

Definition of a garden

Defining what a *garden* is may not be a straightforward task. Humphry Repton (1752–1818), the great English landscape designer, defined a garden as 'a piece of ground fenced off from cattle, and appropriated to the use and pleasure of man: it is, or ought to be, cultivated' (van Erp-Houtepen 1986; citing Repton 1816: *Fragments on Landscape Gardening and Architecture*, pp. 141–2). Amina-Aïcha Malek (2013a:15) describes a garden in wider terms: '*Gardens constitute a specific ecological system demanding constant human monitoring; including interactions between human and nature. Gardens are*

places carefully set apart from surrounding environment...perfected nature according to a specific cultural view.'

People in the past, living in a natural landscape, settled down at their dwelling sites, and presumably started to manage the surrounding vegetation, and to plant selected species, resulting in a garden. At the beginning of the cultivation of plants, people apparently founded vegetable gardens near their dwellings (Jones 2005; van der Veen 2005). The transferral of useful plants from nature to settlements may have begun with edible root and leaf plants before the cultivation from seeds, preceding cereal cultivation. The construction of gardens shaped the landscapes of both wild and cultural areas. Kitchen gardens were located close to the settlement and were used for smallscale cultivation; they are defined as delimited cultivated areas with a boundary (Rohde Sloth et al. 2012). The difference between a garden and a field is unclear, since a garden of a particular culture can be a field to another, but generally in a kitchen garden several species are grown, while in a field only a single crop is cultivated (Rohde Sloth et al. 2012). Many oil and fibre plants, and legumes, thrive in field cultivation, but for example flax (Linum usitatissumum) and pea (Pisum sativum) have been grown by horticultural methods in Scandinavia (Rohde Sloth et al. 2012). Other early garden plants in Sweden include celery (Apium graveolens), dill (Anethum graveolens), henbane (Hyoscyamus niger), and opium poppy (Papaver somniferum) (Rohde Sloth et al. 2012). In addition, Scandinavian gardens may have had an ornamental composition already in prehistory, with e.g. the common daisy (Bellis perennis) (Rohde Sloth et al. 2012).

Defining an existing historic garden is a different task (see e.g. Charter of Florence: Sinkkilä 1992b; Galletti 2013). In a garden originating from the 18th century, old trees could still be original, but the rest of the vegetation has undergone change, even if the species were the same and the specimens were the offspring of the originals. A historic garden can nevertheless be considered as a historical, living monument, and esteemed as a valuable element of cultural heritage, if the idea, design, and landscape have been kept the same as the original.

Gardens as created landscapes, small or large, have not been just plots for useful economic cultivation, or alternatively, sceneries for political play. Gardens have been places where people could be a part of the landscape, experiencing and sensing the planted and designed vegetation around them. Gardens have not been only vegetable or fruit patches for economic use, or aesthetic constructions for beauty and pleasure. Gardens may have been tiny, or grandiose oases combining these economic and aesthetic elements within a constructed cultural environment. Gardens have also been reflections of different eras, measuring and exhibiting historic economic situations, and being impacted by different kinds of climatic periods. Gardens have acted as theatres of political power, as in Turku Castle, and marked colonialism and globalisation (e.g. Ruoff 2001; Martinsson & Ryman 2007). Likewise, they have been indicators of the development of science, botany, and medicine, and they have inspired journeys of exploration (e.g. Kari 1940; Enroth & Kukkonen 1999; Martinsson & Ryman 2007).

Historical sources used in garden history

The traditional study of garden history has been based on historical sources, and the sources used in garden history studies in Finland and elsewhere have been diverse. The letters of garden owners, account books, and well-documented design processes of gardens are important sources of information (Häyrynen 2001; Liski 2001). Drawn maps and landscaping schemes provide evidence of gardens, although they may not necessarily have actualised as they were planned (Häyrynen 2001; Häyrynen et al. 2001; Ruoff 2001). Contemporary paintings offer an insight into past gardens as well (e.g. Ruoff 1993). Still, paintings may not be reliable source material, since a garden owner may have demanded an airbrushed and romantic picture illustrating the magnificence of a garden with any decrepit parts left out, instead of a pedantic imitation of reality. The history of garden art has slightly ignored modest kitchen gardens, which may, however, have been as beautiful and refreshing environments to people living near them as the large landscape gardens were to their owners. Art history has understandably not

focused much on actual horticulture (e.g. Knapas 1988), but the different strands of gardening as an occupation, and gardening as an art, out of necessity, and for private pleasure, were not that far from each other in the Middle Ages (Johnson 1990).

From the late 16th century onwards, there exist lists of garden plants which are, however, sometimes difficult to interpret to an accurate species level, particularly before Carl Linnaeus' time, and hence different interpretations of the species present may occur (Rudbeck 1666; Tillandz 1673; Linné 1748; Kari 1940; Peldán 1967; Ruoff 2001; Martinsson & Ryman 2007). Vegetation surveys of present-day flora in historic gardens provide important data regarding the plants grown earlier at the sites, by pinpointing old cultural species still surviving in the vegetation (e.g. Silkkilä & Koskinen 1990; Järvinen & Lempiäinen 2004). However, a report on the inventories of historic gardens showed that much is yet to be done in Finland (Hartikainen et al. 2013).

In the Scandinavian context, Anna Andréasson et al. (2014a) have shown that the research in garden history is multidisciplinary, and different kinds of sources can reveal valuable information regarding past gardens and gardening. These sources include the results of archaeology and archaeobotany (e.g. Heimdahl 2014a; 2014b; Lindeblad & Nordström 2014), but sources for garden history can even include studies with genetics (Leino et al. 2014, Lindén & Iwarsson 2014).

ARCHAEOLOGICAL APPROACHES

Methods used in garden archaeology

As early as the 16th century in Renaissance Italy, garden history was investigated through excavations by the garden designer and architect Pirro Ligorio, who studied a garden from the classical period (Sinisalo 1997: 53). Later at another Italian site, the "Villa of Horace", the garden was partly excavated first in 1911, then in the 1930s, and again in 1998–2001 with a highly multidisciplinary team including a garden archaeologist, a garden architect, a horticulturalist, and an archaeobotanist. These excavations revealed mostly remains of a Flavian era garden from the late 1st century AD (Gleason 2013a).

Several non-destructive archaeological methods, which do not interfere with the ground, are utilized in exploring gardens. With these methods, garden features can be recognised and recorded both from the surface and underground (Gleason & Leone 2013). The starting point for archaeological studies of historic gardens is the archive study of available old maps, and the comparison of maps from different periods (Luppi 2001a). After the maps, it is important to study aerial photography, which can reveal both visible and ruined features of a garden; this should be done in different seasons, times of day, and weather conditions, since seasonal variations affect, for example, the visibility of crop marks in shallow spots (Gleason & Leone 2013).

Ground penetrating radar (GPR) is one of the geophysical methods used in garden archaeology; it offers reliable information on underground structures, objects, and remains, such as broken-down walls, paths, and edged plantings (Luppi 2001a; Winroth et al. 2011; Andréasson & Pettersson 2014). The surveys with GPR in the garden sites of Mälsåker Castle in Sweden revealed old gravel paths and a garden layout similar to an old map from the 20th century, but also earlier layouts that were not found in the older maps from the 19th century (Trinks 2006).

Historic gardens contain built structures, such as pavilions, water structures, bridges and sheds, or their remains, either on the surface or underground. These can be investigated through excavations, but then they need conservation afterwards. Excavated garden soil can also retain remains of planting pots, indicating pot cultivation or a nursery (Rosengren 1995; Gleason & Malek 2014). Chris Currie (1993) states that flowerpots are perhaps the most common ceramic artefacts recovered from British post-medieval garden sites, although the find category has been quite absent from discussion in archaeological literature. For example, distinctive flowerpots were obtained from a deposit dated to c. I780-1800 at Castle Bromwich Hall site, and their typological identification resulted in the conclusion that two types of plant-pots were in use after c. 1600 (Currie 1993). Planting pots,

found in excavations, have given direct evidence of gardening in Sweden as well (Lindeblad & Nordström 2014). However, in a garden that is excavated, the soil is not only a context from which artefacts are found, but the soil itself is an artefact that must be analysed (Gleason 2013b). It is characteristic to landscape and garden archaeology in general that material culture is closely linked to ecological data, which makes a garden a very complicated object to study under one field season, and thus the field work must be documented with a great accuracy and interpretations drawn from results of several field seasons (Gleason 2013b).

Various scientific methods can be used in garden archaeology. Chemical analyses of garden soil (Ca, Mg, P, ash, pH) have provided information on the fertilisation of cultivated garden plots, in Finland as well as in British cases (Currier & Locock 1991; Murphy & Scaife 1991; de Moulins & Weir 1997; Luppi 2001a). Archaeobotanical methods, plant macrofossil and pollen analyses, can reveal plants that were cultivated in a plot or that grew there as weeds (Murphy & Scaife 1991; Halvorsen 2012; Alanko et al. 2015). Radiocarbon dating of macrofossil remains can also be useful in garden studies (Alanko et al. 2015). Macrofossils of garden species were found, for example, in archaeological investigations at the Ner-Killingberg garden site in Norway (Guldåker 2014a; Heimdahl 2014c). In Finland, macrofossils of garden plants and cultural weeds have been found, for example, at the garden sites of Suomenlinna Fortress, Suitia Manor, Roselund Parsonage, and Fagervik Manor (Lempiäinen 1997; 1999a; 1999b; 2002a; 2002c, respectively). Archaeological and archaeobotanical studies of small garden plots in Sweden have produced new and important knowledge of Scandinavian garden history (Heimdahl & Lindeblad 2014). However, macrofossils of garden plants are not necessarily found in the plots where they grew, but in the excavated household plots where they were used (e.g., Heimdahl & Lindeblad 2014). As Dominique De Moulins & David A. Weir (1997) state, the evidence of what was cultivated in gardens must mostly be found outside the gardens, whereas the plant remains found in garden beds represent fertilisers and reveal activity in middens;

occasionally garden waste is returned to the planting beds.

Palynology, although a substantial part of garden studies, has not been applied to a great degree in historic garden studies worldwide (Grüger 2013). However, pollen remains may reveal the presence of plant species which are able to flower in a northern climate, such as Finland, but do not produce fruits, as well as species which lack their pollinator insects in their new introductory environments, and thus also do not bear fruit. Since most garden plants are insect-pollinated or self-pollinating, their pollen in soil demonstrates plants grown very locally (Grüger 2013). Pollen from garden soil in Norway yielded evidence of garden trees that did not appear in the macrofossil data, e.g., horse chestnut (Aesculus hippocastanum), walnut (Juglans sp.), and lilac (Syringa sp.) (Halvorsen 2012). Insect remains in gardens can also reveal important horticultural relationships, in the form of pollinator or pest insects, found, for example, in stored grain in Pompeii, and at Roman sites in Britain (Murphy & Scaife 1991; Larew 2013). Phytolith studies can be useful in a garden context by providing evidence of gardening practices, such as fallowing and irrigation, or directly through phytoliths from cultigens (Horrocks 2013). Phytolith analysis has been applied, for example, in Ecuador for studying the pre-Columbian subsistence gardening of maize (Zea mays), enabling the differentiation of cultivated forms from wild ones and providing proof of maize cultivation dated to 5000 BP (Horrocks 2013).

An extensive guide of methods, techniques, interpretations, and field examples is given in a recent edited volume on garden archaeology, aiming at a wide understanding of garden studies in their entirety (Malek 2013b). The book explains the various disciplines and methods needed, and presents case studies, although these do not include any Scandinavian cases. The evaluation of different methods used in specific investigations is important, since not all methods are useful in every case (Frost et al. 2004). Still, archaeobotany, for example, is a rather essential part of garden archaeology, and in most cases garden research should not be carried out without it. Case studies of garden archaeology and restoration in Britain, Scandinavia, and Finland

British garden archaeology started in the 1960s, when Christopher Taylor found remains of Tudor or Stuart period gardens. Taylor continued the work with gardens, which led to the acknowledgement of garden remains as a type of national monument, and to the development of the field in a unique way in Europe (Malek 2013c). In the past forty years, the restoration of historic gardens has developed into a popular branch of heritage management in Britain (Currie 2013), but consequently excavations have mostly been directed at the garden sites aiming at restoration (Malek 2013c). Castle Bromwich Hall was one of the pioneer sites, where archaeology was used to assist the restoration of gardens. The application of archaeological and scientific methods to historic gardens, and the preservation of, e.g., bones, seeds, and pollen, were tested at the site. The work at Castle Bromwich created significant innovations in British garden archaeology: it was the first garden site where archaeobotanical sampling was proven to be worthwhile, and where a considerable number of garden beds were found through archaeology (Currie 2013). As for the case of Kirby Hall in England, its investigations, including archaeological excavations in gardens and a reconstruction project, were carried out in 1987-1994, while at the same time this heritage site was continuously open to the public (Dix 2013).

In Scandinavia, garden archaeology is a developing field that has been partly separated into two different tracks: one following the American and British tradition of cultural landscape management and building conservation, concentrating on historic parks and formal gardens; and the other deriving from agrarian and landscape archaeology and archaeobotany within contract archaeology (Andréasson et al. 2014b). Emerging from this background, many successful case studies of garden archaeology and restoration have been carried out. In the garden of Spydebergs Parsonage, Norway, garden archaeological and archaeobotanical methods were used as a groundwork for reconstruction (Guldåker 2012; 2014b; Heimdahl 2014d; Eggen 2015). At Uraniborg, Tycho Brahe's Renaissance garden on the Island of Ven, Sweden, investigation included excavations, a debate about planning, and reconstruction. This resulted in a long and interesting project which had its challenges, but also demonstrated the need for interdisciplinary work (Lundquist 2004). In the case study of the kitchen garden at Strömsholm Castle, Sweden, written sources and maps were used as background information, and different archaeological methods were considered; the study was aimed at advancing the field of garden archaeology, as well as at demonstrating a practical set of methods for this case and for future studies (Frost et al. 2004). The multidisciplinary garden history case in the Milde estate in Norway, had its starting point in pollen and macrofossil analyses, and genetics. It was aimed at the restoration of the garden and succeeded well (Moe et al. 2006). Karin Lindeblad & Annika Nordström (2014) interpreted their research sources and applied different methods in garden archaeology in medieval and early modern Swedish towns, and they could show the presence of horticulture in towns through their excavations. In Norrköping in Sweden, kitchen gardens were found in excavated 17th and 18th century layers, and the plant remains included sour cherry (Prunus cerasus) and cabbage (Brassica cf. oleraceae), among others (Lindberg & Lindeblad 2010).

Garden archaeology is quite a marginal field in Finnish archaeological research: for example, during the period 1996-2005, six garden sites were excavated (Luppi 2001a; Sutinen 2005a). These sites included the gardens of Suitia Manor in Uusimaa, from the 15th century (1996–97, 1998), Brinkhall Manor in Turku (2003–2005), Tullisaari Manor in Helsinki (1998), Roselund Parsonage in Pietarsaari, Pohjanmaa, from the 18th century (2002), and the gardens and parks in Suomenlinna Fortress in Helsinki (1996, 2000), from the 19th century (Fig. 1) (Niukkanen 1998; Härö & Piispanen 2001; Karisto 2001; Luppi 2001a; 2001b; 2001c; Uotila & Lehtonen 2004; Sutinen 2005a). Within these sites, small-scale excavations were carried out by making test pits and ditches, including chemical analysis for phosphorus, but larger areas were also excavated. The investigations targeted, among others, a kitchen garden and an orangery in Tullisaari and Suitia Manors, and a fruit garden and a hop garden



Figure 1. Garden sites excavated in Finland: 1– Suitia Manor in Siuntio, 2 – Brinkhall Manor in Turku, 3 – Tullisaari Manor and Suomenlinna Fortress in Helsinki, 4 – Roselund Parsonage in Pietarsaari. In addition 5–Lahti. Other sites mentioned in the text: 2–Turku Castle, 3–Kumpula and Herttoniemi Manors in Helsinki, 6–Fagervik Manor in Inkoo, 7–Laukko Manor in Vesilahti, 8–Kuusisto Castle in Kaarina, 9 – Naantali Cloister and 10 – Louhisaari Manor in Askainen. Map: Maija Holappa.

in Suitia (Lempiäinen 1998a; Luppi 2001a). GPR surveys were also carried out. They were helpful in Tullisaari, but not all of them were successful (Luppi 2001a). Fortunately, the method has been developed since (Winroth et al. 2011; Andréasson & Pettersson 2014). In the cases of Suitia, Tullisaari, Roselund, and Suomenlinna, macrofossil analyses were also carried out (Lempiäinen 1997; 1998a; 1999a; 1999b; 2002a; 2002b). In addition, archaeobotanical studies have been carried out in other manor gardens in Finland: Kumpula and Herttoniemi Manors in Helsinki (Alanko et al. 2015; Lempiäinen 1998b; Rosengren 2001; respectively), Laukko Manor in Häme (Lempiäinen 2000), and Fagervik Manor in Uusimaa (Lempiäinen 2002c).

In some of the Finnish cases, archaeology has been a part of the background study for restoration or reconstruction of the sites. However, the restorations in Finland have realised the historic gardens mostly as they were in the 18th or 19th centuries, and not as how they may have been in earlier times. This situation arises from the lack of information about earlier gardens. The problem could be solved at least partly through archaeological and archaeobotanical research (e.g. Härö & Piispanen 2001). However, the evaluation of the investigation and restoration of historic gardens is a complex task (Ignatieva 2015; Schnitter 2015). The questions are, what will be restored and why. The garden owner has an opinion, researchers from different disciplines have theirs, and that of a landscape architect may be different from that of an archaeologist. Authorities and funding set limits, and the public has a view as well. Furthermore, it can be questioned whether only sites with a great historical significance should be restored, or also those sites that are more modest but of cultural historical importance (Lundquist 2004). The situation is the same in the evaluation of which gardens should be studied archaeologically, and whether to excavate or only to restore. After the British model of The National Trust, the Finnish Cultural Heritage Foundation and The Society of National Heritage Support were founded in 1986 to protect valuable garden sites. These organisations have acted quite locally, however, and they have not had a greater national impact. Resources for the restoration of old gardens, as well as for garden archaeological excavations, are unfortunately usually limited (e.g. Härö & Piispanen 2001), like were the resources in Finland, when the gardens were first designed and constructed (Häyrynen 2001).



Figure 2. A geometric map of Lahti village. Map: Kuusi 1980, Hollolan historia. In: Hassinen 1999, page 21.

ARCHAEOLOGICAL EXCAVATIONS IN LAHTI VILLAGE

In the field of garden archaeology, not very much has happened in Finland in the past ten years. However, an encouraging case study can be presented, as the large-scale excavations at the market square in the city of Lahti in 2013 revealed an entire garden plot in the former historical village of Lahti.

The village of Lahti was first mentioned in written documents in 1445 (FMU 2622). Almost the entire village burnt to the ground in June 1877 (Nieminen 1920; Takala 1999). Historical written sources from Lahti before the 1860s are very few. The map of Lahti from 1752 (Fig. 2), drawn by Nils Westermark, and the map of 1870, drawn by G.A Jernström, are very important sources, as they provide some information about the structure of the village (Hassinen 1999). In these maps, the houses, buildings, roads, fields, meadows, and land boundaries are visible. However, it is not sure whether all the buildings were drawn in the maps, and some buildings could also be imaginary. Based on the maps, every household had a hop garden, small field plots, and a kitchen garden (Hassinen 1999). From an archaeobotanical point of view, it was going to be interesting to see, if hop gardens, fields, and other structures could be found by archaeological excavations, and what kind of results botanical analyses could produce from these contexts.

Planting beds and the results of archaeobotanical analysis

During the archaeological excavations of 2013 in the Lahti city centre, archaeologists revealed a nineteenth-century garden plot with well-preserved planting beds (Fig. 3 and 4). The planting beds belong to the house called Juhakkala (*Johakala* in the map). The planting beds were discovered under a thick fill layer, which covered the remains of the burned village and formed the foundation for the market square. There were no anomalies or structures above the beds that could indicate the presence of any archaeological remains. However, underneath the fill there was a structure that formed five beds, which were approximately 10 m long and 30 cm deep each. The beds were 0.5–1 m wide, and consisted of clayey soil mixed with sand, small pieces of charcoal, wood, and tiles. They were separated by ditches, which were 40 cm wide. As the planting beds consisted of homogeneous soil, traces of neither digging or tillage technology nor rooting patterns were found at the bottom of them. The beds were founded on a flat ground with an east-west orientation. The boundaries of the garden were clearly visible on the western side, where the beds bordered to a shallow ditch, while in the east and south the area was surrounded by a deeper ditch. The size of the entire garden plot was 70 square metres (Seppänen 2015, pers. comm.).

After the whole structure was uncovered, 30 soil samples for archaeobotanical analyses were taken from the beds, from the bottom of the ditches, and from the vertical profiles of the beds. Altogether 27 different plant species or families were found, and the total number of counted macrofossil remains was 1497 seeds (Table 1). The archaeobotanical material was mainly uncharred, and it was dominated by weed seeds, such as fat hen (Chenopodium album), common fumitory (Fumaria officinalis), and common chickweed (Stellaria media). Besides the weed seeds, there were exotic fig (Ficus carica) seeds, locally growing wild strawberries (Fragaria vesca) and raspberries (Rubus idaeus), as well as the seeds of sedge (Carex sp.) species and rushes (Juncus sp. / Luzula sp.) that were found in an uncharred state. Moreover, charred grains of barley (Hordeum vulgare) and rye (Secale cereale) were discovered. It is worth noting that no remains of chaff were found in the samples.

Based on the analysis of the archaeobotanical material in Lahti, the composition of the plant species and the state of seed preservation was rather variable. In all the studied samples, arable weeds were very common, and the identified plant species flourish on waste heaps, fields, and other kinds of cultural areas with a human impact. The samples included also moderate amounts of sedge and rush species, which both prefer wet or damp environments. The presence of sedges and rushes could result from watering the plants growing in the beds with water from the nearby ditch, which can be seen in the excavation map (Fig. 3). Figs were





◄ Figure 3. Map of the excavation area in Lahti. Planting beds are marked with brown color in the upper right corner and a ditch for irrigation on it's south-western side. Plan: Lahti City Museum / Janne Haarala, Eetu Sorvali 2014.

▼ Figure 4. Photo of the garden plot, which consisted of five planting beds, separated from each other by ditches and confined with a shallow ditch on the west . Photo: Lahti City Museum / Piritta Häkälä 2013.



imported fruits, while cereals were probably locally cultivated, whereas strawberries and raspberries were wild berries collected from nearby. Given that the arable weeds, fig, strawberry and raspberry seeds were uncharred, it can be assumed that these seeds were the remains from human faeces and animal manure that was spread on the fields as a fertiliser. Due to the taphonomy or bioturbance, uncharred seeds may also originate from the modern layers, and do not necessarily belong to the archaeological layers (see, e.g. Evans & O'Connor 1999). The cereal grains were charred, and that can result from charring that occurred during crop processing or food preparation. Charred grains ended up in a field when ashes and dirt from a fireplace or ovens were spread on the planting beds. The charred material has not been C14 dated, as it is assumed that all the charred material belongs to the period when Lahti village was destroyed in a fire in 1877.

As can be seen from the archaeobotanical results, the analysis did not reveal anything that could indicate, which plants were planted in the beds. During the excavations in 2013, when the planting beds had been uncovered and their shape was clearly visible, it was originally assumed that the beds were used for growing potatoes (*Solanum tubero*-

sum). Potato cultivation first began in Finland in the 1730s. At the beginning of the 19th century, the Finnish Society for Economy (Suomen Talousseura) made a great effort to disperse the knowledge of potato cultivation to farmers all around Finland. By the 1850s, the potato was a very commonly cultivated species in Finland, and economically one of the most important plants besides the traditionally cultivated cereals (Soininen 1974; Vuorela 1975; Niemelä 2008). Three neighbouring parishes of Lahti, namely Asikkala, Lammi, and Hollola, were mentioned in historical sources as significant centres of potato cultivation already in the 1790s (Soininen 1974). Earlier archaeological excavations in Lahti in 1997-1998 revealed remains of an oven which contained 46 charred potatoes. They were all well-preserved, but in a very fragile condition. According to the archaeological dating of the context, the oven and the potatoes dated from the end of the 18th

or the beginning of the 19th century (Lempiäinen 1999c).

Empty planting beds

Even though there are historical maps of Lahti, which reveal the locations of gardens and other cultivated areas, we still do not know where the gardens were exactly located, and what was cultivated in them. In the historical maps of Lahti, the gardens are generally located behind the houses and in the backyards. In the light of the archaeological excavations, however, it is evident that gardens were also founded in the middle of the village, where the wells and ditches ensured the access to a continuous water supply. It is notable that the planting beds found in Lahti were not marked on the historical maps. Therefore, it is impossible to estimate the importance and frequency of this kind of planting system in the village of Lahti. However, Westermark's map from 1752 (Fig. 2) indicates that every house had plenty of free space in their lot, and these empty areas were most probably used for cultivation and gardening to some extent. In Sweden, Elisabeth Gräslund Berg (2014) and Pia Nilsson (2014) have also studied the locations of gardens in historical maps, and noted that not all the garden plots were marked on the maps.

Archaeobotanical analysis did not reveal any traces of the plants that could have been grown in the planting beds in Lahti. This result is also rather common in other studies related to gardens plots and fields. Planting beds are also known from Castle Bromwich Hill, England, dated to the 1850s (Currie & Locock 1991). In Castle Bromwich Hill, the archaeobotanical material consisted of weed varieties, some cereal grains, and chaff. However, it remained unresolved as to what was grown in the beds. According to Currie & Martin Locock (1991), the beds could have been used for anything from growing melons or cucumbers, to planting shrub-like plants, such as roses. The planting beds could also have been used as a nursery garden, from where the plants were moved to somewhere else. On the other hand, the beds could have been used for growing root vegetables or legumes (Currie & Locock 1991). All these plants can grow in planting beds, and they do not necessary leave any traces or archaeobotanical remains.

It is understandable that the planting beds are found empty of archaeobotanical material. First, vegetables and legumes were harvested and carried away when they were ripe, and the leaves were left to decompose in the field or thrown to the dung heaps, while shrubs and seedlings were relocated to a suitable place for long-term growing. Of course, there is also the possibility that the planting beds were not in use at all, or were only used infrequently, and therefore weeds were flourishing there.

Although the archaeobotanical data from Lahti could not shed light on either the cultivation history or the cultivated plants, it is without question that the peasants in Lahti village had gardens and cultivated plants. Most probably, they grew swedes, potatoes, cereal crops, legumes, and cucurbits, as well as linen, hops, and tobacco, since we know that peasants were selling these products at the market (Nieminen 1920; Heinonen 1999). The planting beds in Lahti were well constructed, and when archaeologists found them, they were well-preserved. The boundaries of the garden were clearly visible, so it seems certain that the garden was meant for growing something, since it was so carefully laid out. The boundary ditch was also meant to lead water away and keep the beds moist, but not too wet. The nearby ditch ensured a regular water supply to the garden. The orientation of the beds, from east to west on open land, guaranteed the optimal conditions for the plants to grow. Given the structure of the beds and their location at the back of the plot, as well as the earlier archaeobotanical finds of potatoes from Lahti, it is credible that the farmers of Juhakkala (Johakala) were growing potatoes in the planting beds in their backyard lots.

CONCLUSIONS

Written records and maps concerning garden sites in Finland from the Middle Ages onwards have been studied and interpreted quite many times, but more knowledge could still be revealed from these sources through new investigations. For future research in garden archaeology in Finland, one of the

major challenges will be the shortage of funding. Still, there is a need for archaeological research at the Finnish sites connected to gardens that have no written sources, or at least none from the oldest phases. It is assumed that medieval gardens existed in Finland, for example, in Kuusisto Castle, Naantali Cloister, Louhisaari Manor, and Suitia Manor (Härö & Piispanen 2001; Ruoff 2001; Lempiäinen 2003; Uotila 2004; Frondelius 2005; Alanko & Uotila accepted). Only a few written documents from the medieval period exist. Some of the oldest are those concerning gardens in the 15th-century Turku, both in the town and in the castle (Ruoff 2001). Although it is known from the history of Turku Castle that Duke Johan (later King John III of Sweden) established a great Renaissance garden in the place of an old kitchen garden in the 1550s, and a list exists of the medicinal plants cultivated in the castle's garden in 1583, no precise descriptions or identified physical remains of the garden have been found (Peldán 1967; Sinisalo 1997; Häyrynen 2001). It could be interesting to archaeologically investigate those garden sites which are known to have a long history of various phases over centuries, and aim at establishing separate time layers for these gardens. An example of this kind of site would be Suitia Manor, which is, according to literature, said to have one of the oldest gardens in Finland, dating back c. 470 years (e.g. Härö & Piispanen 2001; Sutinen 2005a). It might also be possible to demonstrate chronological changes in vegetation and garden cultivation at some sites through radiocarbon-dated macrofossils from excavated layers (Alanko & Uotila accepted).

The problem of the lack of information is even greater regarding vernacular gardens in towns and rural sites, on which written documents may be impossible to find. This illustrates the necessity to study medieval or even early modern gardens archaeologically, and the evident potential of archaeology and archaeobotany in garden history research, because the available historical sources are not adequate. In Sweden, archaeobotany has revealed small kitchen gardens, which are older than was expected from written sources, as well as hidden medieval urban gardens (Heimdahl 2010; Andréasson et al. 2014b; Heimdahl & Lindeblad 2014). As a result, the overall level of knowledge has improved, and history has been rewritten to include, for example, Viking Age gardening in Sweden (Heimdahl 2010; Heimdahl & Lindeblad 2014). Earlier, questionable assumptions were made, due to the scarcity of documents, arguing that proper gardening did not exist in Finland (i.e. Sweden) in the Middle Ages. Literature has occasionally ignored knowledge about plant species and kitchen gardens as uninteresting, stating that no garden existed if it was a plot of herbs. On the other hand, as early as before the eruption of Vesuvius in AD 79, even the most modest houses in that area had tiny gardens, which were identifiable by archaeology, and they have been acknowledged as important elements of our understanding of that culture (Jashemski 2013).

Archaeobotanical studies are a part of garden archaeology, as well as a part of archaeological research in general. However, as was noted from the excavations carried out in Lahti, the investigation of the planting beds did not reveal macrofossil plant remains, which could have indicated the plants cultivated in the garden. However, the knowledge of weeds and other plants still increases our knowledge of the human - plant interactions. At garden sites, macrofossil analyses should be carried out both on the garden soil and on the cultural layers associated with the buildings and waste pits, because remains of garden plants can be found more often in the latter contexts. For the future of garden archaeology and garden history studies, applying archaeobotany is worthwhile when the research questions include identifying the planting and plant species in gardens. Garden history is such a wide field for research that all relevant disciplines and perspectives from art history to archaeology should be involved, but most importantly, the discussion and collaboration between these disciplines should be maintained.

NOTES

Parts of the text of this paper, excluding the section on the archaeological excavations in Lahti, will also be published in the summary of the PhD thesis of the first author, Teija Alanko.

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