
Vikingekøkkenhaven: To What Extent can an Experimental Viking Kitchen Garden Contribute to the Understanding of the Importance of Plants in Viking Society.

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2024



Master's Degrees by Examination and Dissertation

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Abstract

Many ancient and historic societies relied heavily on agricultural practices, but little is known about how essential gardening was to them. The primary goals of this dissertation are to better understand what plants early mediaeval Scandinavians and Vikings used in Scandinavia and Scandinavian-occupied Britain. To understand why these plants were used and how, whether medicinal, spiritual, or practical; and to recreate a kitchen garden space similar to mediaeval Scandinavian examples through experimental archaeology. This experimental kitchen garden will contribute to this research by bridging the gap between these components and offering a better understanding of Viking gardening practices and their practical uses.

Acknowledgements

I want to take this opportunity to thank the many people who helped and inspired me throughout the last two years and over the course of writing this dissertation. First of all, thank you to my supervisor Professor Nigel Nayling, who's guidance and support has not gone unappreciated.

Thank you, Debby and Dan, for your help with the experimental side of my project, as without your help I would not have been able to complete any part of it, please relay my thanks to the sheep who allowed me to have a very specific insight into the implications of creating fencing near livestock.

To my student support Blue, Kim and Alastair, Thank you. To Blue who's shared passion for gardening helped me create the main premise of this dissertation. To Kim, without your help this dissertation would not have been possible. And Alastair, whose support was invaluable to me.

And finally, thank you to my friends and family. To Cleo, Emily, Camille and Clark, thank you for always being there for me in my time of need, for inspiring me, taking me on walks and supporting me throughout my ups and downs. To Sam, Ciara, and the boys, thank you for the Sunday dinners got me through. Thank you, nan, for nurturing my love for gardening throughout my life to the point I was able to complete such a massive undertaking such as this. And last of all, I owe you a massive thank you mum, for always supporting my love for archaeology and history. The reason I am able to submit this dissertation is all because of your unconditional love and support.

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Introduction

Kitchen and home gardens have existed alongside agriculture with the two being inextricably connected for as far back as humans have utilised agricultural techniques. Despite their long standing presence in agricultural societies, home and kitchen gardens have yet to be fully understood and subject to the same experimentation that agricultural practices have (Miller & Gleason, 1994, p. 1). The archaeological study of agriculture largely benefits from its impact on surrounding landscapes, the large areas of land usage for agricultural practices more extensive traces in the landscape for archaeologists to identify and record. The technological advancements of agriculture, such as irrigation, crop rotation and the invention of ploughs left similarly significant marks on the landscape that are easily identifiable and studied (Renfrew and Bahn, 2023, p. 257). The challenges for an archaeologist when it comes to studying a garden are primarily methodological, as cultivation was on a much smaller scale, and as a result highly advanced and more specialised approaches are preferable. The study of ancient and historical gardening greatly benefits from the implementation of archaeobotany, pollen and soil analysis, microstratigraphy and phytolith analysis (Madella & Lancelotti, 2012, p. 76). It is likely that the level of specialisation needed to accurately examine historic garden practises is the reason that the archaeological research of ancient and historical gardening has been consistently overlooked in favour of agricultural farming.

In terms of experimental archaeology, agricultural farming can be more easily replicated. This is in part due to the social and economic importance of farming to almost all forms of early cultures around the world. The reliance on agriculture as a key feature for many ancient cultures has resulted in many references to agricultural practices being written down or preserved in some form and surviving into today's archaeological record. One notable example of this preservation is seen in Ancient Egyptian depictions that illustrate the entire process from sowing crops to harvesting and using the produce to create food, perfumes, oils, and cosmetics. (Janick, 2002, fig. 1, p. 5, fig. 6, p. 11). With painted depictions of the agricultural practice, and the care taken to depict the various stages of the agricultural process, it is easy to see the importance of farming and relatively large-scale agriculture. It is the relative frequency of accurate descriptions of agricultural practice that make imitating it far simpler than the recreation of small scale and personal gardens. Despite the

comparable lack of depictions of gardening in ancient and historical sources, and the less frequent discussion surrounding the importance of the garden in historic cultures, it does not mean that the practice of gardening was any less important to everyday life.

Before continuing, it is essential to discuss the terminology that is used throughout the paper. The word “Viking” is not an ethnic descriptor, it is a title that specifies a job, and it will be used like this throughout this dissertation. The term early medieval Scandinavian will be used when discussing non-Viking Scandinavians. The two terms are not interchangeable. Despite this important distinction between the two terms the term “Viking age” will be used throughout the dissertation as it is a simple and familiar description for the time period covered (approximately 793 CE-1050 CE (Barrett et al., 2000)).

The main objectives of this dissertation are to better understand what plants early medieval Scandinavians and Vikings were using both in Scandinavia and Scandinavian occupied Britain; for what purpose were these plants being used, whether medicinal, spiritual or practical; to recreate an experimental garden space similar to medieval Scandinavian examples to be used for research, educational and recreational purposes. An additional objective is to understand the relationship between the plants that were grown and their social dynamics. By engaging with experimental archaeology this research hopes to contribute to the academic understanding of early medieval Scandinavian gardening practices and to gain a clearer insight into how important gardening would have been to the Viking and Scandinavian people of this time.

It is to be noted that the writing in this dissertation will be divided between third person and first person. The literature review, methodology, and first chapter will be written in the third person, while the second and third chapters, as well as the conclusion, will be written in the first person. This decision stems from the deeply personal nature of describing the creation of the garden and its process, which would feel insincere if written differently. It is important to distinguish the personal experience of constructing the gardens from the discussion of their archaeological and historical context. The dissertation focuses on Viking kitchen gardens primarily due to the lack of extensive research in this area. The goal is to compile all

accessible information on Viking age plant use and their gardening practices into a cohesive piece of writing. This study will be enhanced by the experimental kitchen garden, which aims to bridge the gap between the two components and provide a better understanding of Viking horticulture methods and their practical applications.

The main section of this dissertation will be in chapters one, two and three. Chapter one is a desk-based analysis of the historical background and context of the environment that Vikings and Medieval Scandinavian people would have lived in and why the plants they used were so important to them in everyday life. Chapter two focuses on an in-depth description of how the experimental gardens were built using the relevant historical context from the previous chapter, and the documentation of the progress. Chapter three contains the main discussion and review of the experimental progress, what was successful about it, what could have been done better and what further experimentation and research could go into the study of Viking gardening practices. Despite there being a lack of major research into Viking gardens it is still valuable to learn from small scale experiments such as this one.

Methodology

The objective of this dissertation is to establish an understanding of the appearance of a Viking kitchen garden by constructing an experimental garden that was aided by additional historical and archaeological research and was constructed in accordance with pertinent archaeological and historical evidence. This garden was not feasible to replicate within a one-year timeframe. Garden archaeology is a highly specialised field of archaeological research that emphasises the design of landscapes, horticultural practices, ancient and historical gardens (Jacques, 1997). Garden archaeology and experimental archaeology are complementary to each other due to their mutual objectives. They both are long-term studies that archaeologists can observe, they both have a distinct focus on the process of creation, and their main objectives are to replicate and reconstruct (Malek, 2013, Mathieu, 2002, Petersson et al., 2020).

When looking for research into this subject, it is noticeable that a project like this has not yet been completed, not in the way that this dissertation is planning.

Experimental archaeology is an extremely valuable approach to the topic of Viking gardens as the limited research on this topic reveals only a fragment of the historical uses of plants within Viking society. The purpose of experimental archaeology is to utilise the modern understanding of past building materials to recreate something that has previously not been understood. Ideally, the tools used for this project would be replicas of those used around 700-1100 CE., Due to financial limitations, these tools were not an available option, and modern tools were implemented in their place. Complicated equipment such as power tools and specialised garden utensils, will not be necessary to complete this project. instead, simple accessible tools will be used such as a shovel, axe, saw, rake and mallet. Although they will not be replica tools, they will be serving the same function.

The main archaeological theory used within this dissertation will be post-processual archaeology. The reasoning behind this is that this dissertation is heavily reliant on the archaeological evidence and the varied interpretation of the evidence through social and cultural contexts (Hodder, 1991). The cultural and symbolic focus within post-processualism also allows a view of a material item that is not only from the perspective of function but understands that the symbolic meaning of a material item

is just as important, sometimes possibly more important than the actual function of an object (Trigger, 2006).

When creating any kitchen garden there are many things to consider before any practical work can commence, for example, climate, seasons, frost dates, temperature, rainfall, soil type, sunlight availability and placement of the garden space. The climate of a location is essential to the growth of the plants; the plant hardness scale is a detailed geographical database that will be useful to determine the temperatures that plants can withstand (Peter, 1990). As the experimental garden for this dissertation is located in the south of Ceredigion Wales it is important to consider how the climate, and soil conditions compare to those locations home to Viking settlements. The Lampeter plant hardness zone is 9a to 8b (United Kingdom Interactive Plant Hardness Zone Map, no date). The plant hardness zone map is a system that is based on the average annual minimum temperature and aids in selecting plants that would thrive in specific temperature zones. The plant hardness zones of Denmark are 9a, 8b, and 8a (Denmark Interactive Plant Hardiness zone map, no date) which are similar to the hardness zones of the north and east of England near known Viking settlements such as in York. Norway's hardness zones range from 2a to 10a (Norway Interactive Plant Hardiness zone map, no date) which is much colder than Denmark or Viking settlements in England, making it harder for them to rely on crop production to supplement their diet.

Figure 1 is a graph depicting the rainfall in Lampeter from 2009 up until the present day. Between October and December, the rainfall consistently stayed between 68mm and 167mm of rainfall although in 2024 the average rainfall for October to December was 213mm, a considerable increase of rainfall not seen before in the years that the graph shows. Similarly, from January to March the average rainfall usually stays between 66mm and 125mm of rainfall with one anomaly in 2014 showing the average rainfall to be 158mm. In 2024 the average between January and March was 150mm, still well above the average since 2009, excluding the anomaly in 2014. The implications of a substantial increase in rainfall will be further explained in chapter 2 of this dissertation.

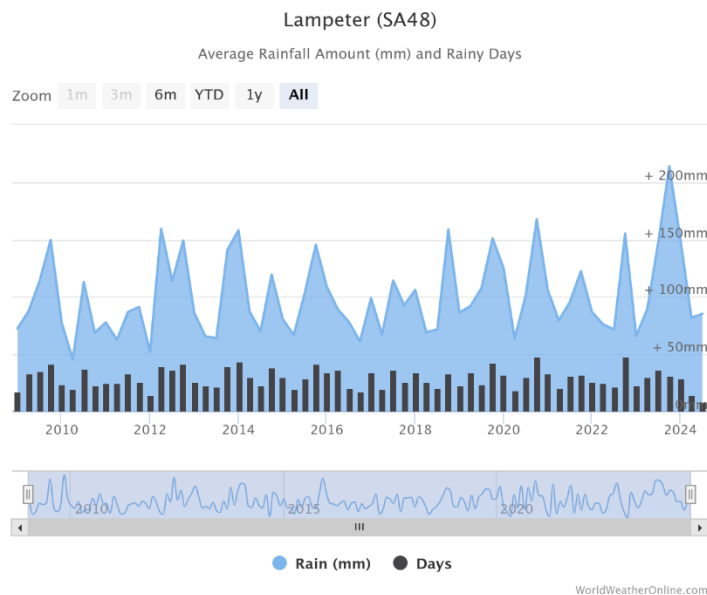


Figure 1: Yearly Rainfall and Rain Days Averages (2024)

The physical garden experiment will take place in two locations, one is on private land and the other is located on university grounds next to the existing allotment spaces. Each of these locations has its own separate benefits and disadvantages as the environment surrounding them is distinct from one another. For ease of understanding, Garden One will be the off-campus garden as it

was created first, and Garden Two will be the on-campus garden. Both of the gardens will experiment with different aspects of a garden space. In Garden One fencing will be a primary element of the experiment whereas in Garden Two the growth of plants and the sowing of seeds will be the main focus of the experiment.

The small-scale landscape characteristics of the two locations are comparable in certain aspects, although there are more differences than similarities. The biggest similarity of both locations is that soil compositions are very similar to each other in the sense that they are both difficult to work with as they are both well compacted and contain a large number of rocks of different sizes. This is not beneficial to the growing process of root vegetables and can hinder their growth significantly; because of this, after the digging process many of the larger rocks will have to be removed by hand. Another similarity is the weather conditions at both sites are comparable as despite their separate locations they are situated within a few miles of each other, it is important to note that whilst the temperatures between the two sites where similar Garden One may have been more susceptible to wind and rain as it was far less sheltered by modern buildings than the Garden situated on Campus. These factors are vitally important to keep in consideration whilst conducting this experiment as despite the similarities it does bring in some potential inconsistencies in the overall data collection. It is also through considering these differences that made choosing two different primary focuses for the two gardens. Garden One

focuses on the fencing and the construction of the garden site, and Garden Two on the planting process and the growth of the plants.

The individual differences of the two gardens are far more considerable. The location of Garden One is on private farmland that expands over 20 acres with the garden itself situated on a grass clearing close to the main farmhouse. Prior to the creation of the garden the clearing is surrounded by brambles, willow and hazel trees which will all eventually be removed. The presence of the plants here will be a benefit as the willow and hazel cuttings will be used to build the garden fence rather than being left unused. Garden One is also actively being used as a small holding for farm animals mainly sheep and chickens. This garden space is also the one one of the two that will continue to be used after the process of this dissertation. It will not be taken down and will continue to be used as a home kitchen garden indefinitely, with more plots added in the future as and when more space surrounding it is cleared. Garden Two is located on the Lampeter University campus grounds so the surroundings of this garden are more variable compared to Garden One. There is a relatively high amount of footfall in the location as it is located next to the accommodation buildings. Due to its place within a public area, it is important to be aware of the potential for complications with the garden, that may be caused by interference from curious members of the public, this is however, a minor concern as actions have been taken to mitigate how this may affect the garden. Since this is the garden that will be used to plant all of the crops specific attention to the area surrounding it needed to be taken into consideration such as testing the pH of the soil.

After testing the pH levels of the soil of garden two it ranged between 5.58 and 5.76. This means that the soil is slightly acidic but not too acidic and action needs to be taken to ensure the plants will grow. Taking the pH levels into account when making a garden, ensures that the soil is not too acidic or alkali as this would be detrimental to successful plant growth (Brady & Weil, 1999). The implication for the experimental garden is that the slightly acidic soil should not have a negative effect as it is still within the normal range. However, soil respiration becomes less effective at lower pH levels and fungal respiration becomes more prevalent (Neina, 2019). Where this project differs from an authentic early medieval Scandinavian kitchen garden is that they would not have had the ability to test the pH of the soil and would have planted

a kitchen garden wherever convenient. Of course, the Vikings would have used animal manure could be used as a natural way to raise the pH of the soil (Bell and Mathesius, 2016), but due to the financial limitations, I would not be able to acquire any.

There are approximately 28 different crops that could be planted in the allotted garden space on campus. The list of plants that will be planted in Garden Two has been sourced from relevant archaeobotany reports and archaeological analysis. Crops like barley, wheat, oats and rye will not be planted although having an incredible significance culturally to the Vikings (Rowley-Conwy, 1988). The reasoning behind this being that they are farming crops, and this dissertation aims to separate farming practices and crops from gardening practices and crops.

The final outcome for Garden Two is to create it and then take it down but one idea for uses of the produce grown could be used to create a Viking-inspired feast to signify the ending of the project. However, this outcome will rely on the crop production and yield of the crops in the garden. The reason why a Viking feast could be an outcome for this dissertation is the importance of feasts in a Viking society and their use for almost every major or minor celebration within the community (Davide, 2023). Additionally, the feast would serve as an appropriate expression of gratitude to those who contributed to the garden's development. There is a high probability that the crop yield will not be enough for a feast so the remaining foods will then be sourced locally. Other plants can be foraged and picked in season and stored either in the freezer or preserved in preparation either by fermentation, pickling or salting. Other foods that Vikings would have used or had access to that are not available to grow or forage will be bought, for example, cloudberry jam.

To sum up the mythology, this dissertation aims to create a reconstruction of a Viking kitchen garden through experimental archaeology, make sure to emphasise the significance of historical and archaeological evidence. The project highlights the challenges involved in creating such a garden, ultimately seeking to contribute to the limited research on Viking gardening and drawing attention to the cultural significance surrounding food in Viking society.

Literature Review

The papers in this literature review represent the three key aspects of this dissertation, experimental archaeology, archaeological evidence of kitchen gardens and plant evidence describing what would have been grown around the time the Vikings would have created such gardens. This literature review serves the purpose of evaluating existing studies of Viking kitchen gardens and plant use.

One of the most influential papers for this dissertation is a paper written by Sloth, Handsen and Karg (2013) which focuses on the diversity, taphonomy and cultural aspects of garden plants from early medieval Southern Scandinavia. This paper, which examines plant material remains, has guided my selection of plants for the experimental garden. It also highlights that prehistoric gardens, like the one being developed for this dissertation, are often overshadowed by research on agriculture and farming, resulting in a lack of information on horticultural practices. The complete range of plants cultivated in gardens during this period remains unknown due to poor soil preservation. This paper is one of the main sources of what remains in the archaeological record for this time period and highlights that our knowledge of the full range of plants cultivated in gardens at that time is limited. It points out that poor weather conditions and soil preservation are major factors contributing to the scarcity of surviving plant material from this era in the archaeological record. A majority of the evidence in this paper relies on 14 archaeological excavations, surveys and reports from Danish sites but is also supported by evidence found in Great Britain, Sweden, and Germany. The excavations and reports have been collected from reputable published sources and archaeobotanical reports. A lot of the evidence of plant remains comes from plant macrofossils, seeds and fruits, as well as the stems, flowers and roots. Many of the limitations that will be faced while accomplishing the practical and written aspect of the dissertation are also represented in this paper, such as the lack of information surrounding the topic of archaeobotany in Viking studies. The exploration of kitchen gardens in experimental archaeology, for the most part, is also underrepresented and unexplored within academia leaving an opportunity for investigation.

The Coppergate 16-22 excavation is also an important resource for this dissertation as it fully describes the layout of Viking buildings and houses in Viking age York.

Similarly, the Coppergate excavations are integral to the understanding of Scandinavian life within Britain and shows us how they would have lived their everyday lives. Artefacts and environmental evidence from the site are well preserved with them being in deposits up to 9 meters deep. The environmental evidence consisted of post and wattle structures dividing up property and smaller scale boundaries within one home plot, industrial activity including glass making and iron works, wattle and daub walls for housing, and burial sites. The waterlogged deposits at Coppergate were also a perfect environment for collecting organic materials such as wood, which is why so much is known about the types of wood that Vikings would have used for building materials. As a result, the York Coppergate excavations are a relevant source of kitchen garden analysis. Although any archaeological evidence of kitchen gardens and specifically Viking kitchen gardens are rare, educated speculations of possible locations can be determined by macrofossil evidence and fence boundaries. Tenement C is the one tenement in the 16-22 Coppergate excavation paper to identify the possibility of a kitchen specific garden, defined by its wooden fencing outline (Hall Et al, 2014, p 587). Although this is extremely relevant it is to be noted that no pollen samples or organic plant material has been found in this speculated garden so it is unknown what the homeowners would have grown in this space.

Another important source that will not be referenced much within the paper but is necessary to mention inside of this literature review is the collection of early medieval Scandinavian laws that mention the protection of home gardens from theft, specifically referring to angelica (*hvannastulðr*), fruit and vegetable (*skafþpiuver*) and turnip (*næpnastulðr*) gardens (love et al, 2020). The laws referencing these protection laws are inside of the *Gulatingssloven* (The *Gulating* Code of Laws). The *Gulatingssloven* is the oldest parliamentary assembly in Norway laws that are credited to Harald Hárfagri but is known to have connections to the late Viking age and first transcribed in 1164 Magnus Erlingsson (Larson, 1932, pg 8). There are many laws within the *Gulatingssloven*, some of them include, the govern the conformity of Christianity, contracts relating to land sale and leasing, property ownership, matrimonial law, inheritance law, and criminal defence, and a collection of laws handles coastal security of Norway's western sector, which the *Gulating* area includes. The existence of these series of theft laws suggests that personal gardens

containing angelica, fruit and vegetables were more common than originally thought and shown in the archaeological record and were significantly important to a household.

There are also other articles that do not reference the Vikings but so describe the creation of an experimental garden that could be used as a beneficial source to reference. One key source is by Burtenshaw and Harris (2007) which is also an experimental archaeology gardens project that aimed to investigate the productivity of ancient Māori cultivars of sweet potato in New Zealand. The paper examines the ancient Māori cultivar of sweet potato known as 'Taputini,' which was cultivated long before Europeans had contact with the nation. There are two experimental archaeology gardens in this project with them being located at sites on either side of Cook Strait in New Zealand. Over the course of seven years, the researchers recorded the labour inputs required for cultivating these gardens. They investigated the soil properties and collected data on crop yields to evaluate the economic aspects of pre-European Māori sweet potato gardening. Their findings indicated that the gardens produced an average yield of 12 metric tons per hectare. This yield was comparable to modern sweet potato cultivars and was 3 to 4 times higher than most previous estimates of pre-European sweet potato production. The reasoning behind adding this paper to the literature review is because it is an inspiring example of experimental garden archaeology.

The examination of experimental archaeology, combined with the analysis of primary and secondary sources, sheds light on the diversity and cultural significance of garden plants from early medieval Southern Scandinavia. Despite the challenges caused by the lack of written and archaeological evidence, the research shows opportunities for the study of horticulture and kitchen gardens within Viking society. The inspiration from Sloth, Handsen, and Karg's essay, has influenced the selection of plants for this dissertation experimental garden, as well as emphasized the necessity of extensive research in this topic. The insights gained from the York Coppergate excavations have provided crucial evidence and speculations interpreting layout and potential locations of Viking kitchen gardens.

As this research develops, it becomes clear that the investigation of Viking Kitchen gardens and the evidence of plants they contain provide both difficulties and

possibilities. It is evident that there is a need for more investigation and experimentation, with the possibility of multidisciplinary collaboration. This analysis establishes the foundation for future research and highlights the need of addressing the deficiencies in our understanding of Viking horticulture.

Chapter 1: Historical Context

Chapter one is a historical analysis of the use of plants in everyday life in Viking Scandinavia and Scandinavian occupied Britain. Examples are Food preparation, dyes, alcohol, medicine and religious practices. Additionally, wood, considering the use to build some of the most iconic visuals in Viking history such as longships and longhouses, to the most commonly used basic tools, bowls, spoons fences and pathways. The trade routes and towns that the Vikings had access to are directly influenced the kinds of plants and produce that they would have been able to grow; thus, understanding the historical context of the Vikings is essential to comprehend the flora and fauna they would commonly have had access to.

Food and diet

In early mediaeval Scandinavia, the majority of the diet consisted of livestock and pastoral husbandry, which was often accompanied by arable cultivation of cereal grains to maintain a staple diet (Sawyer & Sawyer, 1997). Apart from pastoral and arable farming, their diet also consisted of items from hunting and foraging, including fish, molluscs, nuts, berries, and mushrooms (Milner et al., 2007, National Museum of Denmark, 2007, Perdikaris & McGovern, 2007). While Viking kitchen gardens are poorly documented, references to several planted vegetable gardens mentioned in Norwegian legislation exist, and it is known that at least leek, cabbage, and angelica gardens were maintained (Foote and Wilson, 1970).

Table 1: Some of the known plants of the Viking age and their uses

Plants	Where they were found	Food/drink	Medicine	Dye plants	References
Angelica	Hedeby, Denmark	√	√		Sloth, Handsen and Karg, 2012, p.29
Barley	Øster Aalum	√			Rowley-Conwy, 1988, p. 189
Beans	Tinggård, Denmark	√			Sloth, Handsen and Karg, 2012, p.29
Bishops Weed	Fyrkat, Denmark	√	√		Sloth, Handsen and Karg, 2012, p.29

Butterbur	Århus Søndervold, Denmark		√		Sloth, Handsen and Karg, 2012, p.29
Cabbage	Fyrkat, Denmark	√			Sloth, Handsen and Karg, 2012, p.29
Cannabis	Oseberg, Norway		√		Price, 2021, p. 169
Carrot	Elisenhof, Germany	√			Sloth, Handsen and Karg, 2012, p.29
Celery	Elisenhof, Germnay	√			Sloth, Handsen and Karg, 2012, p.29
Chickory	Hedeby, Denmark	√			Sloth, Handsen and Karg, 2012, p.29
Coriander	Fyrkat, Denmark	√			Sloth, Handsen and Karg, 2012, p.29
Cumin	Oseberg, Norway	√			Sloth, Handsen and Karg, 2012, p.29
Dill	Denmark	√			Sloth, Handsen and Karg, 2012, p.32
Garlic	Northern Germany	√			Knörzer and Gerlach 1999
Goodking Henry	Denmark	√			Sloth, Handsen and Karg, 2012, p.32
Hazelnuts	Klinta, Sweden	√			Price, 2021, p. 100
Henbane	Fyrkat, Denmark		√		Roesdahl and Ostergard, 1977
Hops	Elisenhof, Germany	√			Sloth, Handsen and Karg, 2012, p.29
Madder	Bjerringhøj, Denmark			√	Vanden Berghe et al., 2010
Mustard	Fyrkat, Denmark	√			Sloth, Handsen and Karg, 2012, p.29

Oats	Øster Aalum	√			Rowley-Conwy, 1988, p. 189
Onion	Viborg Søndersø	√			Sloth, Handsen and Karg, 2012, p.29
Opium Poppy	Viborg Søndersø		√		Sloth, Handsen and Karg, 2012, p.29
Peas	Århus Søndervold	√			Sloth, Handsen and Karg, 2012, p.29
Rowan Berries	Klinta, Sweden	√			Price, 2021, p. 99
Rye	Øster Aalum	√			Rowley-Conwy, 1988, p. 189
sage	Fyrkat, Denmark	√	√		Sloth, Handsen and Karg, 2012, p.29
Soapwort	Archsum				Sloth, Handsen and Karg, 2012, p.29
Turnip	denmark	√			Sloth, Handsen and Karg, 2012, p.29
Wheat	Øster Aalum	√			Rowley-Conwy, 1988, p. 189
Woad	Bjerringhøj, Denmark			√	Vanden Berghe et al., 2010

Food preservation

When the Vikings had to adapt to a new climate, they would have had to adapt the way they acquired and stored food. Ways they would overcome this would be to store foods by smoking, fermentation, salt-curing and drying. Cloudberry, *Rubus chamaemorus*, were a commonly used plant that would be used to stave off scurvy in the Viking age (De Luca and Norum, 2011). Due to their relatively short fruiting season and their reputation of being difficult to cultivate on a large scale they would have to be preserved (Nilsen, 2005). It is unknown how the Vikings would have exactly preserved cloudberry, but it is known to have been stored in a large barrel and taken on voyages with them (De Luca and Norum, 2011, Fægri, 1958).

Preserving foods was essential for Scandinavians as it would allow them to have access to different food sources throughout the harsh winters as well as on their long journeys by sea.

Dyes

Scandinavia has a long and interesting tradition with textiles that's origins begin well before the Viking era (Vanden Berghe et al., 2010), but with the access of more fabrics and dyes through trading routes, more options were becoming available as the Viking began sailing overseas. With new revision written by Vanden Berghe, Mannering and Rimstad (2023) on textiles found in Bjerringhøj, Hvilehøj and Hedeby, a more accurate insight into what plants early medieval Scandinavians would have used as dyes. All of the following information is from one paper because it is a concise and reputable new source about multiple locations. From the Bjerringhøj site they found evidence of luteolin yellow which could have been made from most common fruits and vegetables (Heber, 2011), clubmoss, woad, indigo, ellagitannins from an unknown source and madder. At the Hvilehøj site they found Kermes, clubmoss, madder, woad, indigo and shellac resin. Finally, at the Hedeby they only found evidence of ellagitannins.

The social importance of food

The importance and role of food and drink should not be underestimated, especially in Viking society. The practice of eating together forms a sense of community in addition to establishing, and maintaining, group identity (Eriksen, 2019). A family within a household would cook around the main hearth and eat together while their slaves would have eaten in a separate location, most likely at a different time reinforcing their role as master and slave and separating them socially (Naumann et al, 2014). What a person ate and especially who someone ate with, created a sense of hierarchy. Feasts were important for emphasising the hierarchical nature of the Vikings. The type of food that a person had access to completely depended on whatever social class that person was a part of, although this was not always the case for people in the lower classes. Slaves, although having the lowest status in Viking society would have had a similar diet to the average freeman (Naumann et al, 2014). More wealthy freemen would have had access to trade and more expensive food items which often included highly prized and rare spices imported from the

middle east (Svendsen & Svendsen, 2016). Kings, Jarls and people of higher status would have access to the most expensive food and drink items. Although social status would have played a significant role in what a person would have been able to buy and grow, for the purpose of this dissertation the garden will not be defined by any social status.

Despite the fact that most food items could be acquired locally, the wealthy would have had access to other more exotic and expensive goods such as spices and wines which would have been imported from around Europe (Foote and Wilson, 1970). Luxury foods and drinks were not often used for personal consumption in private but used as status symbols in public. There are accounts of Jarls competing with each other to give their armies, and each other, increasingly expensive and rare gifts (Winroth, 2012). Feasts were a central part of Viking culture and occurred at almost every kind of celebration no matter how big or small. Feasts would accompany weddings, funerals, religious ceremonies, changes in the season, a successful voyage (Mainland & Batey, 2018). The main element of any Viking feast would be the alcohol provided. Beer and mead were especially valuable products; this significance extended to the ingredient's barley, malt, wheat and honey (Unger, 1988). Beer was the key to any feast, so if there were failed crops of barley or wheat, they would have to import the ingredients for special occasions in order to provide the guests with alcohol (Jarman, 2021).

Medicine, Intoxicants and narcotics

Although mind altering substances would not have played a major role in daily life for the Vikings there are two notable instances of them being used: one in relation to sorcery and the other attributed to the berserker state related to some Viking warriors. The most well-known being the berserkers, who were a specific kind of warrior who were known to go into a trance while in battle (Price, 2019). This frenzied trance-like state was first theorised to be caused by the consumption of the fly agaric *Amanita muscaria* mushroom by Samuel Ödmann (1784) and accepted by other scholars up until the 1970s (Fabing, 1956 and Hoffer, 1967). Recent investigation of the symptoms matched the state of berserker to recognised herbs utilised at the period, hypothesising that it was more likely to be black henbane, *Hyoscyamus niger* (Fatur, 2019). Henbane can be an intoxicant used to cause this

state and when applied in an ointment form around the anus, armpits and chest is known to result in the sensation of flight (Clifton, 2019).

The other use of intoxicants and narcotics that is notable to Viking society would have been the use of them in relation to sorcery (Price, 2019). Henbane was found in a woman's grave in Fyrkat; this is commonly thought to be the grave of a *völva*. A *völva* is a sorceress related to the *seiðr* which is a magic practice associated with pre-Christian pagan belief systems in Scandinavia (Price, 2019). There is a high probability that the seeds could have been burned in a fire, or the plant used as a smudge, purificatory smoke, then inhaled. The description of this practice are described as, when inhaled, is a "dizzy rage" (Schenk, 1955) mixed with a strong sensation of flying and fear (Schenk, 1955). Therefore, due to the the cultural importance of henbane in Viking society it will be included in the experimental garden.

Other narcotics found on archaeological sites are cannabis seeds in the Oseberg ship burial (Price, 2019, p169). It is unclear whether the cannabis seeds in the grave was symbolic of hemp production or for other mind-altering uses. It is known that Scandinavians had the ability to grow hemp as early as 350BCE (Skoglund et al., 2013). The main uses for hemp were in rope production (Andersson, 1999) and in fine textiles (Skoglund et al., 2013). Its uses for its mind-altering properties in the Viking age are largely unknown, but it is feasible, as during the excavation of the Osberg site the remains of a small leather pouch with more remnants of cannabis seeds were found (Price, 2019). The pouch was too small to hold the number of seeds for successful hemp harvest and it was suggested by Ingstad (1992) that they would have held a symbolic meaning and possibly could have been used in the same way that henbane seeds would have been used, thrown into a fire and inhaling the smoke.

Wood

Denmark today is one of Europe's least forested counties with 14.9% of the county being populated with forest land (Wilson, 2023). In the early Medieval era this was not the case, the country was highly populated with forests and therefore wood was not a scarce resource but still incredibly valuable (Sawyer & Sawyer, 1997). Wood was used for everything from tools, buckets, barrels, tableware, handles, shingles,

and fencing to houses, churches, ships, furniture, including beds if a person was wealthy enough (Hall, 2007, p45, Foote and Wilson, 1970, p178).

Hardwood trees such as oak, ash, willow, hazel, alder and birch were abundant and were most commonly used (Ravn, 2016). In relation to this dissertation, willow, hazel and birch are the most important, as young growth of the plants are ideal for weaving and constructing wattle fencing and wattle pathways (Hall et al., 1983). The use of wattle structures are essential to most early building practices as the materials are readily available and easy to assemble. In combination with the use of daub, the structure can become quite durable, and this method has been used for over 6000 years in many different cultures from around the world (Shaffer, 1993).

Chapter 2: The creation of the experimental garden

As mentioned in the introduction, this chapter will be written using the first person as I do not want to be distanced from this project and would like my personal feelings and opinions about the process to be conveyed accurately, in line with Gibbs' Reflective Cycle. The description of the making of the gardens will be written in chronological order. In addition, as mentioned in previous chapters, for ease of understanding Garden One will be the off-campus garden and Garden Two will be the on-campus garden. The choice to create two gardens for this project was primarily influenced by the original time constraints encountered when applying for permission to create the garden space as during the initial stages of this project the response time from the university was longer than expected. As a result, Garden One was created to allow some progress early on. Starting this garden at an earlier stage also allowed for a practice run in fence building and allowed more time to locate local materials that may be used in the project's future. While I have previously made smaller gardens and raised beds, I had never undertaken a project of this scale, nor had I constructed a wattle fence. The additional time available during the early stages of development was invaluable, allowing me to gain a deeper understanding of my role in the creation of these two gardens. In this chapter I will provide further details on the distinct construction of the two gardens. Garden One's development began with the construction of a fence, whereas Garden Two started with soil tilling and planting. Furthermore, the gardens differed significantly in shape: Garden One was circular with a diameter of 8 metres, while Garden Two was rectangular, measuring 5 by 4 metres. These differences highlight the varied approaches and designs implemented in their creation. There is no historical or archaeological evidence to suggest that there was a preferred shape in garden construction, the choice to create two different shapes was purely for aesthetic purposes as they better fit the shape of the land provided.



Figure 2: The location of garden one (personal collection, 2023)

The location of the garden one is on private land, the majority of which is used as a small holding for sheep and chickens. Figure 2 is a picture of the space that was used for the garden. The garden first started on November 11th, 2023. As this garden was not used for any kind of crop production during my project, I did not need to till the ground. To the left of the

image there is a tree stump, at the beginning of the project it was ignored as there was no major benefit or disadvantage in removing it at this point, the wattle fencing was built around it. In the background of figure 2 there are many young willow branches thick enough to be used to construct the wattle fencing and this is where I started to cut the first branches for the fence. Figure 3 is a picture of the progress after cutting down the pieces of willow that were thick enough to be used; the thinner willow branches are too small to be used effectively and will be left to grow or will stay in place until the area is cleared. At the centre of figure 3 I attached a blue string that was measured to approximately 4 meters to a stick that I hammered into the ground. Using this piece of string I was able to mark out where the fence posts would be placed, making the diameter of the garden 8 meters, giving me a total of approximately 50 sqm in space.



Figure 3: mapping out the garden (personal collection, 2023)



Figure 4: Tree before harvesting (personal collection, 2023)



Figure 5: Tree after harvesting (personal collection, 2023)

Figure 4 pictures the first tree that I was able to cut down and figure 5 what is left of the tree after the process of felling had taken place. The tools used to complete this were a basic hacksaw and handsaw for cutting down the main branches and an axe was used to cut off any protruding branches from the willow which I found suitable to be used in the fence.

This task was significantly more challenging than the wood cutting shown in figure 5 as many of the thicker and taller branches were tough and hard to cut through. It was at this point I realised how much of a significant undertaking this process is going to be as the amount of wood needed to finish the fence was significantly more than I first anticipated. However, with an abundance of willow trees on the land, sourcing wood was not a concern. I received permission to use as much willow as needed, as the trees were marked for removal in the future. This unlimited access allowed me to proceed without the worry of finding an external wood supply and ensured that the project would continue to move forward.



Figure 6: The first fence posts to be put into the ground (personal collection, 2023)

Figure 6 shows the first posts in the ground. The fence posts were approximately 1m to 1.5m tall and spaced 1.5m away from each other in a circular pattern. The posts were inserted into a premade hole which was created using a metal rod with a pointed end. Using the willow cut from behind the garden as the tree in figure 2, 3, 4 and 5 the wattle fence started to be erected (figure 7). All of the wood woven in this picture used all of the functional willow branches from the last two harvests. It was evident to see just how many would need to be utilised in making this fence.



Figure 7: The weaving begins (personal collection, 2023)



Figure 8: The noticeable chew marks on the wood from the sheep (personal collection, 2023)

Figure 8 shows the gnawing pattern on the fence posts left by the sheep which was an interesting observation that I would not have otherwise made if I was to only make my garden on campus. Animal interference from livestock was not something that had originally crossed my mind at this point as I did not think that it would

have any impact on the garden itself. However, the more I thought about it the more I started to think it could have actually been beneficial to some extent to prevent further growth of the willow. Over time this act would be detrimental to the integrity of the fencing and could lead to the wood needing to be replaced; however, in the short-term animal interference played a role in retaining the current state of the woven willow. Figure 9 shows some of the sheep that were on the land at the time, and I did notice that when I was cutting down the wood and cutting off unusable branches, they would always be around to eat any foliage left.

December 6th, 2023 was also the last day that I worked on Garden One until august of 2024, the reasoning behind this was because at the time, unknown to me, I had a herniated disk in my lower back and working on the garden,

cutting down wood and working on the fencing was taking a massive toll on my body and I was in a lot of pain.



Figure 9: Mutual observation (personal collection, 2023)

February 19th was the day I officially started to make progress again on the garden, specifically garden two. I had been given permission to place the garden at the top of campus next to the already existing allotment plots. Although this was not my original idea for the placement it actually turned out to be favourable. The plot got enough sunlight during the day without it being too overwhelming as there were surrounding trees that helped keep it shaded.



Figure 10: Mapping out garden two with string (personal collection, 2024)

When I started to dig the plot, I began to realise that the ground was very compacted, possibly due to the high amount of footfall; not only was the ground hard it also had a lot of stones as well as some roots from nearby trees. The roots were not a major interference as they could be dug

around but the majority of the stones, especially the larger ones, were taken out by hand. The

northwest side of the plot was a challenge as the number of rocks were considerably more and not all of them could be removed. The way I decided to approach this was to plant root vegetables and plants with significantly larger root systems on the southeast part of the plot and other plants with a less substantial root system would be planted deeper in the northwest side. The digging of the garden took about month to dig because I was in pain, and I did not want to cause my back further damage. Thus, the garden was dug by mid-March and



Figure 11: The garden space successfully dug and ready to be planted (personal collection, 2024)

ready to be planted immediately.



Figure 12: Waterlogged soil (personal collection, 2024)

All of the seeds were planted by the end of March. Unfortunately, on the 4th of April I found out that the garden had become completely saturated with water, waterlogging the entire area. There was not much I could do for the garden until the rain stopped and the soil had started to dry up. I checked on the seeds a week later and noticed that the larger seeds like peas, beans and beetroot, had all failed to germinate and rotted in the ground.

To plant a second round of seeds I then had to wait until the end of April because until then it was still waterlogged. Figure 13 is an illustration of the placement of the second harvest of seeds. I planted the seeds in this specific way so that the plants would have the best chance of growth; the taller plants were planted on the northwest so that the shorter plants would not be compromised by the lack of sunlight in their shadow. At this point I was worried about how late I was planting because of the abnormal weather we were having in Lampeter and how successful the garden would actually be.



Figure 13: The map of seed plantation in garden two (Harris Burton, 2024)

The next collection of photos, figure 14 to figure 18, is the progress of growth on the 22nd of June.



Figure 14: The progress of growth: peas and beans (personal collection, 2024)



Figure 15: The progress of growth: woad, dill and angelica (personal collection, 2024)



Figure 16: The progress of growth: horseradish (personal collection, 2024)



Figure 17: The progress of growth: mustard greens (personal collection, 2024)



Figure 18: The progress of growth: more mustard greens (personal collection, 2024)

Plants like the parsnips, carrots, turnips, sorrel, thyme, soapwort, henbane, hops, madder, and good King Henry had shown very small amounts of growth and are not pictured here.



Figure 19: Tire marks and grass covering the southwestern side of my garden (personal collection, 2024)

On the 17th of July when I came outside to check on my garden, I saw there had been another incident. The grounds keepers had mowed over the entire southwestern side of my garden, figures 19, 20 and 21 show the evidence of this. Not only had the garden been mowed and driven over but it had dumped grass over the whole southwestern side. The full damage of what had been done to the garden was revealed when I had taken the grass off. The mustard greens, sage, soapwort, henbane and poppies had been partially to completely crushed. The

only plants able to survive this would be some of the mustard greens and sage. The poppies, henbane and soapwort would all have to be replanted for the third time with the very few seeds I had left over.



Figure 20: Destroyed horseradish (personal collection, 2024)



Figure 21: A close up of the tire tracks (personal collection, 2024)

With the garden once again in a condition that made replanting and starting over the only option, and the timeframe for completing this garden looking much too short, I felt completely defeated. Between the consistently bad weather and this incident I knew from here that the outcome of the garden would not be as successful as I had planned it to be. This was an unfortunate realisation, but I would not give up on it and continue to try to make it as successful as possible, despite the problems I had encountered.

On the 6th of August I was able to harvest my first crop, which was peas (figure 22 and 23). The harvest came from 5 pea plants and was enough to feed at least one person. Ideally, I would have liked to have more produce from the pea plants, but I am happy with the outcome as I was not going to eat them, but I wanted to save them for seed so I could continue to plant peas from this project in my own home garden to continue its legacy.



Figure 22: The first harvest, 1 (personal collection, 2024)



Figure 24: The first harvest, 2 (personal collection, 2024)



Figure 25: Garden two fence (personal collection, 2024)

On the 11th of August I started to build the fencing around garden two, figure 24 depicts this. The wood from this garden was sourced from the area around garden one as I was not able to acquire wood from anywhere else. The fencing in garden two was going to be much shorter than the fencing in garden one as it did not need to be as tall. The reasoning for this is because I wanted the fencing in garden two to act more as a low laying boundary rather than a substantial fence that was needed in garden one to keep livestock out.

On the 18th of September the beans were also ready to harvest. The yield was not as substantial as I would have preferred because some were eaten by slugs, but again, same as the peas, I was not looking to make a meal with them, I wanted to keep them for seed instead.



Figure 26: The outcome of the bean yield (personal collection, 2024)

On the 24th of September I returned back to garden one to finish the fencing there as well as acquire more wood for garden two. Figure 26 shows the finished fencing for garden one. From this picture it is noticeable to see that the entry point from figure 26 has been covered and woven into the rest of the fencing with the opening now being on the opposite side of the fence. The reasoning behind this was that creating a functioning gate was not feasible in the remaining time had so it was a reasonable to create a different entry point in another location as I did not want to leave it open, so a hurdle was the best decision (figure 27).



Figure 26: The finished fence of garden one from where the opening was woven shut (personal collection, 2024)



Figure 27: The finished fence of garden one from the new entry point (personal collection, 2024)



Figure 28: The finished garden two (personal collection, 2024)

Figure 28 is a picture of the finished fencing of garden two and the last photo I took of this newly finished project.

Chapter 3: Discussion

Before I delve into the key findings of my experiment and how they align with the primary objectives of this dissertation, I'd like to take a moment to reflect on the various plants I observed growing within the boundaries of Garden Two throughout the experimental process. I anticipated that local plants would interfere through seed dispersal, which meant I would need to engage in regular weeding. However, as time went on, I began to welcome their presence. While weeds are often viewed negatively in gardening contexts, I found that in this instance, they provided intriguing insights into the foraging practices of the Viking diet and medicinal uses. This unexpected aspect of my research highlighted the complex relationship between cultivated and wild plants, and it was apparent that Viking settlers too would have encountered the creep of local flora into their own garden spaces, and perhaps encouraged some of these usually unwanted intruders to grow. Some of the plants I noticed growing in the garden were, an unidentified species of fumitory, common selfheal, hedge woundwort, creeping buttercup, broad leaved willowherb, common soapwort, broadleaf and ribwort plantain. All of the plants listed have been used for medicinal purposes, but fumitory and creeping buttercup are known to be toxic (Pan, Wang and Chen, 2022, Mukhamedsadykova et al., 2024, Englund, 2019, Granica et al., 2014, Samuelsen, 2000). They could be considered weeds in any other situation however due to their intrinsic uses; I will refer to them as “weeds” with inverted commas. Another thing growing in the garden were fungi, to be specific the red



*Figure 29: Red cracking bolete
(personal collection, 2024)*

cracking bolete *Xerocomellus chrysenteron*. They are mycorrhizal with hardwood trees (Francis-Baker, 2021), which means that the hyphae of the mushrooms have a symbiotic relationship with the roots of trees, exchanging valuable nutrients between one another (Sheldrake, 2023). They are edible when young but as they age, they are not desirable due to the fact that they degrade very quickly when picked, have a bland taste, and that their texture when cooked is slimy and very soft (Philips, 1981).

The presence of “weeds” in Garden Two can offer a very real look into what a Viking Garden could have looked like in their Western British settlements. Whilst today we often label these plants as “weeds”, these same plants are likely to have been seen as valuable resources and readily available food or medicinal herbs that could be foraged as needed for the early medieval Scandinavians. This perspective is rooted in the understanding that the Viking settlers would have had to make the most of what was available to them in the landscapes surrounding their territories and highlights the practicality of their gardening practices. However, it is important to note that this is largely speculative; if these plants were appearing in garden spaces, they likely thrived in the surrounding area rather than being intentionally cultivated.

Overall, I have mixed feelings about the success of this project. I believe that there are parts of it that have been rewarding with objectives met. There are other parts of this project I think I could have done a lot better. One of the main objectives that I believe was met, was to better understand what early medieval Scandinavian plants that the Vikings would have used, for what purposes, as well as their importance to them. Food and Viking community are completely entangled with one another, from a daily family meal to extravagant feasts held for any occasion, flaunting them as a sign of wealth, rewarding soldiers with expensive food and drink, medicine and religious practices. Furthermore, people within one town may have interacted with specific plants for a definite purpose. For example, a *völva* would interact with plants that other people may not have because of their danger, such as henbane. They also would interact with plants that an average person may have used for a soup but instead she would use it for medicinal application or a ritual.

Early medieval Scandinavians were a society made up of farmers, many of these would have owed sheep, as their wool was incredibly valuable not only for clothing and blankets but also for the wool sails Vikings would have used on their ships (Øye, 2013). This relationship between person, structure and animal was highlighted in Garden One and whilst unexpected the sheep gnawing on the fencing was a surprising outcome and to have the opportunity to witness how livestock would have interacted with man-made structures and how the interactions of many different roles came together in one place to aid in the everyday running of a Viking settlement. It

was fascinating to witness this relationship first hand in my own garden and is one part of this experiment I felt worked well.

One significant limitation I faced in making this garden more historically accurate was the lack of funding available for the project. If I had had more financial resources, I would have invested in period-appropriate tools. Using these tools would not only enhance the authenticity of the experience but would have also provided a deeper insight into what it may have been like to build an authentic Viking kitchen garden. Experimental archaeology offers valuable insights into the past, but unfortunately, I was not able to maintain that level of authenticity in my own work.

An unavoidable situation I encountered this year was the impact of extreme weather conditions on my garden. The UK has experienced significant rainfall, leading to crop failures for many gardeners and farmers, as confirmed by conversations I've had and articles I've read online. Swainston (2024) described in his blog post about how this spring has been considerably harsh for gardeners, and due to all of the rain that we had this year, the slugs and snails are eating what little there is of his existing crops. Whilst the extremely wet and windy weather we have experienced over the last year is in part caused by the climate change emergency Wales and the world is facing it is important to note that harsh growing periods would have still been present during the Viking era. These challenges would have required them to be practically minded, adapting their techniques to cope with the unique climates and landscapes of each settlement. To combat any difficulties, they faced in cultivating crops, the Viking settlers likely relied heavily on other means of food production, such as foraging, fishing, and livestock farming, to supplement their diets. As stated earlier, in addition to livestock and the farming of grains for beer and meads, they also relied on hunting and foraging for fish, molluscs, nuts, berries, and mushrooms (Milner et al., 2007; National Museum of Denmark, 2007; Perdikaris & McGovern, 2007)

Considering how late I had to plant because of the waterlogging and the replanting of seeds I did not expect a sizable harvest, nor did I expect many plants to thrive in the conditions. The strongest plants that grew were the peas, beans, angelica, dill, mustard greens and horseradish. Other plants for example, carrots, land cress, celeriac, swede, henbane, poppies, good king henry, thyme, and rosemary failed to grow at all. Even with some semi successful crop growth and harvest the yield I

received from the peas and beans would not realistically feed a fully grown adult for a long period of time yet their growth supports the use of a kitchen garden not as a primary source of food production but as a supplementary food producer and would have been ideal for making more palatable meals (Sawyer & Sawyer, 1997). Feasts and food played a key role in both Viking and Medieval Scandinavian culture and these small-scale gardens may have played a role in supplementing flavourful meals in place of merely providing sustenance to those eating the food.

Time was probably the biggest limitation hindering the success of this project; gardens take a long time to grow and establish themselves. The couple of months I was able to use the land was not long enough for a substantial experiment. If I was to do this experiment again, I would like to make it a long term, consistently ongoing experiment that would be monitored over time. In addition, I would like to make it a collaborative project. I did most of the work on the gardening on my own and I do not have much gardening experience apart from my own home garden. If I could have the opportunity to make this garden again, I would like to have more input from other more experienced gardeners and involve them with the process. Although the Viking age was characterised by hierarchy, it is also true that they had a strong feeling of community, with food serving as the primary uniting factor. Gardening may have been a similar strategy, with many people working together on a project to achieve a favourable outcome.

Conclusion

The conclusion section to this dissertation is only going to be a very short chapter as I feel like I have discussed and summarised the key points of my dissertation in my discussion chapter. To conclude, the main objectives of this dissertation was to understand what plants early medieval Scandinavians and Vikings were using both in Scandinavia and Scandinavian occupied Britain; what were the plants being used for and to recreate an experimental archaeology garden based on available evidence. Using experimental archaeology as a tool to better understand early medieval Scandinavian gardening practices. I believe that I was successful explaining why plants were useful to Vikings and early medieval Scandinavians, and what the plants would be used for. Although I was able to create a garden using evidence of known Viking age plant and food material, I was unable to create a garden that was completely successful in achieving the desired outcomes. Despite this, there is a lot more to understand about Viking kitchen gardens and the way that they functioned. As I stated in the previous chapter, I would be interesting to repeat this project again in the future with all of the information I have now, and more.

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