CULTIVATING CURIOSITIES:

PLANTS AS COLLECTIONS IN THE EIGHTEENTH CENTURY

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Abstract

Gardens and plants were popular subjects for recreation and scholarship in eighteenth-century Britain. Wealth was invested into the creation of elaborate pleasure grounds, newly introduced exotic plants were purchased and cultivated with relish and extensive collections of dried plants were collated. Studies of eighteenth-century botany, horticulture and gardens have diverged in current research, creating a split in ideological interpretations of plants, their taxonomical systems and the gardens in which they were cultivated. The well-preserved archive at Burton Constable Hall in East Yorkshire provides a unique perspective on gardens, indoor and outdoor collections which can help to unite isolated historical disciplines into a cohesive narrative.

Enlightenment ideals, the Baconian system of inductive reasoning and a new, empirical approach to natural philosophy had created a new, scientifically-based, eighteenth-century culture in which botany could flourish. Seventeenth-century scientists had proven that an empirical approach could transform a human understanding of the world, and publications, societies and coffee houses made their discoveries popular. The cabinets of curiosity held for wonder and exoticism became assemblages of natural philosophy which could help to order and understand the world through observation and classification. Scholarship and collection became fashionable, and a means of making new connections and forging social identities. Plants held economic, medicinal and social potential, and were at the forefront of this development. This thesis will discuss the evidence at Burton Constable and related case studies to demonstrate that plants were part of the tradition of collecting a cabinet of natural philosophy in the eighteenth century, and that by considering them as such we can take a new, holistic approach to their cultivation and to the pleasure ground which should influence future interpretations of eighteenth-century gardens.

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Burton Constable Herbarium Catalogue: each volume presented on a separate tab

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DECLARATION

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as references.

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CHAPTER 1: INTRODUCTION

During the eighteenth century botany and horticulture were at the forefront of scientific research: they were promising economic ventures, proven social tools and objects of scholarship. Since the sixteenth century, explorative expeditions around the world had generated an unprecedented influx of botanical specimens and viable plant material into Europe. Plant explorers were sent to the new world by monarchs to gather the world's exotic bounty for England, and by wealthy sponsors eager to gain riches for themselves. By the transition to the next century, even the less wealthy could be involved by joining a syndicate which sponsored an explorer and took a share in the rewards. The world was rapidly being discovered by colonising western nations and a taste of exotic flora was arriving in Britain for wonder and analysis, but the excitement was not limited to plant material.

Fuelled by the emerging and seemingly limitless possibilities of enlightenment thinking, collectors feverishly gathered natural and cultural artefacts in the pursuit of new discoveries. An understanding of the world through the accumulation and examination of its component parts was a common goal of early modern collectors who often gathered huge assemblages of naturalia. This development from the earlier collections of curiosity and wonder for show and status brought practical as well as social purpose to cabinet collections. The more nuanced approach encouraged new participants from the gentry who desired to align their social identity with the enlightened. There was much to be gained within social circles and for personal amusement by allying oneself with the natural philosophers whose applications promised to transform knowledge, economy, health and scientific thought. Plant material played a large part in this cultural transformation, and will be considered here in the context of enlightenment-based collections. Considering plants as collections throws a new light on garden spaces and places the tradition of herbarium collection at the centre of the indoor and outdoor cabinet in the eighteenth century.

This thesis was inspired by the wonderfully preserved archive at Burton Constable Hall in East Yorkshire, which, by its comprehensive nature, allows an integrated study of the living plant collections and indoor 'static' cabinet, or museum. William Constable, the inhabitant of the house throughout the mid to late eighteenth century, was an avid plantsman, collector, and *virtuoso*. Constable inherited the house in 1747 and transformed it into a place of fashion and scholarship. Landscape and garden evidence sit alongside an extant 'curiosity' cabinet[1], a pressed plant collection or *hortus siccus*[2], correspondence and bills of purchase, allowing

[1] The term is used here as the most commonly understood descriptor, but its definition will be discussed further in later chapters.

[2] The terms '*hortus siccus*' and 'herbarium' are often used interchangeably to describe collections of dried, pressed plants.

consideration of the cultivation and collection of plants and plant material as curiosities and objects of science. The Burton Constable hortus siccus has been catalogued as part of this project and focused the direction of the thesis towards the subjects of collections, collecting and science rather than the alternative angles of networks, empire, technology or trade. Through this focus, the enabling of a more holistic understanding of the garden and its collections has facilitated a critical analysis of the plant collections and their purpose.

As at Burton Constable, gardens and plants throughout the country were markers of eighteenth-century fashion and taste, a central concern of life in Britain. For a member of the gentry, a country estate spoke of societal status and alliances, wealth, political affiliations and a familiarity with figures from classical literature or mythology. Plant introductions to the western world are well discussed in relation to this style of garden-making, in addition to their impact on economy and health but are less well understood in relation to traditions of enlightenment collection. Cabinet collections of natural philosophy which may be displayed within a house are rarely allied to the living collections outside. Plants were introduced to the west as curiosities in the same manner as historical and cultural artefacts, but their dynamic ability to live on and transform, associated with their inherent ephemerality has led to a divergence in their consideration during historical analysis. This thesis will consider the close link between these two types of closely related collections.

This combined approach provides a platform from which to discuss the place of plants in a wider vision of eighteenth-century society, focussing on the pursuit of Baconian order and classification, the legitimisation of scholarly status and the enabling of productive relationships between the academic and gentlemanly classes. The diversity of the collection culture and the necessity to site it within a specific social, economic and political context (Swann, 2001, p. 8) dictates that the study should not be too geographically broad, and so it will primarily consider the collections of Britain with reference to those of comparable cultures. By doing so, it will attempt to produce an integrated picture of the motivations and methods of assembling examples of vegetative material and associated artefacts, acknowledging the breadth of the tradition, and its spread and differentiation across societal groups. This approach will provide a wider context for the consideration of specialised garden spaces in the eighteenth-century landscape.

Recently, the empirical and descriptive traditions of garden and plant historical research have begun to give way to analytical studies which emphasise the individual, the detail, and the motivation, for example Mark Laird's *A Natural History of English Gardening* (Laird, 2015), Tom Williamson's *Polite Landscapes* (Williamson, 1995) and Sarah Easterby-Smith's (2018) *Cultivating Commerce*. This study will build on this welcome development in scholarship to discuss the role of plants and gardens in knowledge building, highlighting their active roles in

forming the identity of the eighteenth-century collector. It will discuss exotic and native collections, explore their modes of construction and use, and set them in the context of the enlightenment ideals of the gentleman *virtuoso*. This approach enables a discussion of how enlightenment ideals, new advancements in natural philosophy, scholarship and access to new and intriguing taxa came to transform both the physical and intellectual landscape of eighteenth-century Britain.

The flora of newly discovered lands was part of the bounty to be claimed by its explorers and collected by the wealthy. It was a living slice of fresh and alien kingdoms to be parcelled up and shipped home to the wonder and delight of the metropolis. Knowledge and new plant specimens were seized with relish by the monarchy, gentry, scientific community, traders and middle-classes. Plants were prized for their potential medicinal properties, productive plants made traders vast fortunes and rarities for personal collections were prestigious symbols of status and knowledge. The plant trade spread its net wide across the country, enticing those with the means to purchase and inciting curiosity for the new, rare, useful and fascinating. Rather than meretricious ornaments, plants were an active catalyst for economy, scholarship and polite society. This was big business. The plants which are a common feature of our gardens today held a social power it is difficult to conceive.

The far-reaching impact of the new arrivals pervaded many elements of society. The nursery trade blossomed. The Brompton Nursery, which was later taken over by London and Wise, was founded in 1681 and quickly grew into a large and popular business. Other nurseries followed suit, firstly centred around London and then spreading north, forming significant hubs around Oxford and York from the early eighteenth century. In *Early Nurserymen*, John Harvey (1974, p. 9) stated that the trade in plants "was an offshoot of the age of discovery, of exploration, of world trade, of colonial expansion and of imperialism". Easterby-Smith (2018) has recently built on this work to demonstrate that these commercial frameworks contributed to the evolution of public scientific culture during the Enlightenment. The plants which were a direct result of the colonial age were a catalyst for social change.

The influx of flora, fauna and other natural artefacts such as shells and fossils raised a new problem for scholars. Making sense of the world and its component parts required an order or structure in which to classify them based on their similarities and differences, and a system of nomenclature which would allow scholars around the world to communicate consistently and effectively. Many ideas on how to establish such a structure were proffered throughout the seventeenth and eighteenth centuries, with botanists Bauhin, Ray and Tounefort all outlining their own suggested schemes of classification (Campbell-Culver, 2001, p. 122). The muddle that

ensued was eventually resolved by Carl Linnaeus's controversial sexual system developed in the middle decades of the eighteenth century (Blunt, 1971). It ordered and made sense of the floral kingdoms with potential for limitless future expansion and a worldwide focus. The natural world began to resolve itself into orders, classes, genera and species, and Linnaeus's system was made all the more accessible by the proliferation of available published work. The collections of curiosities and plants gathered by the wealthy could now be efficiently organised, and their owners were able to display their knowledge and mastery of the world's component parts. The sexual system made plant classification and ordering easier for the amateur collector, stimulating an increased interest in botany (Huxley, 2007, p. 135).

During the Enlightenment, scientific enquiry was conducted increasingly in universities and societies (Porter, 2003, p. 8), but also by enthusiastic gentlemen amateurs. The Royal Society, founded in 1662 for the purpose of improving natural knowledge (The Royal Society, 2018) embodied the diversification of social circles within the scientific community. Membership brought kudos and opened up social networks. The new societies and coffee houses facilitated social links within which different classes could communicate as equals and gain advantage from others. Knowledge was both a commodity and a desirable quality in the creation of personal identity, and knowledge was gained by experience and observation. This new intellectually-based order was a product of both the Enlightenment and polite society.

The collection of artefacts became a popular pastime for the wealthier classes, developing from the lavish aristocratic cabinets of the sixteenth century (MacGregor, 2007, pp. 9-10). The cabinets of curiosity so popular in the seventeenth century evolved into collections for philosophical and scientific study in addition to their traditional roles as objects of entertainment (Turner, 1985). Plant material was as much a part of the cabinet tradition as the more familiar shells, minerals and ethnographic artefacts, with seeds, roots and pressed specimens being common additions. Significant innovation in glasshouse technology allowed an increasing variety of tender plants to be successfully cultivated on country estates, creating an outdoor living cabinet for investigation and inquiry. Plants could now join the cabinet phenomenon as living specimens in their own right. Vegetative specimens as the new, wonderful and curious came to be in high demand.

The seasonal nature of growing and the difficulties of maintaining tender plants through European winters required early systematists to develop methods by which their work could progress unaffected throughout the year (MacGregor, 2007, p. 129). Historians of gardens, botany and science agree that the herbarium collection or *hortus siccus* of dried plants solved this problem and was often a feature of more privileged horticultural lives in the eighteenth century. Kent and Allen's (1984) survey of surviving herbaria provides the most comprehensive list to date of collections made and recorded over the last five centuries in Britain and Ireland.

Originally intended as a tool for botanical researchers, the data provides a fascinating insight into the scale of the herbarium phenomenon during the enlightenment period. To date, however, the study of the collection of dried plants has been lacking in context, and a consideration of how it linked the horticultural and scientific spheres in the minds of professionals and the gentry is overdue. The *hortus siccus* has slipped between the gaps of scholarship, being on the fringes of interest of garden and botanical scholarship, and rarely considered within the scope of a traditional view of museums and collections.

Recent scholarship on plants as natural history, and progression in the field of museum and collection studies has positioned plant collections firmly within the cabinets of curiosity of the seventeenth and eighteenth centuries. In his history of museums entitled *Curiosity and Enlightenment*, MacGregor (2007, p. 129) acknowledged that, "although the formation of living collections of plants forms a fascinating parallel to the activities under investigation, it must remain beyond our scope here". As the history of collections has also not yet been applied to histories of plants, it is necessary to now consider the two fields as a whole to create a true picture of plant collections – both living and dried – in the eighteenth century.

METHODOLOGY

The ephemerality of plants and their poor survival in the historical record requires an investigation of the fragmentary evidence from a number of different case studies in order to construct a broad history of eighteenth-century plants, collections and their context. The Burton Constable collection and archive contains the most complete record for this style of plant collection in the UK. The unique survival of William Constable's cabinet of curiosity alongside his meticulous habit of retaining both correspondence and bills of purchase has created a unique resource within this sphere of research. Constable's cabinet contains a ten volume *hortus siccus*, or herbarium, comprised of almost one-and-a-half-thousand plant samples.

For the purposes of this study, the entire *hortus siccus* of William Constable was photographed, transcribed and catalogued by the author by volume. This included an analysis of the plant material in terms of provenance, condition, type classification (eg. shrub, annual) and origin where possible. Rather than a botanical assessment of plant nomenclature and origin, it was decided that the broader archive provide an unparalleled opportunity to understand more about the place of a *hortus siccus* within the wider collection of an eighteenth-century gentleman, and so the its make up was considered in comparison to both the living and static collections. Constable's organisation of the collection, his reference to external classification systems and the handwriting within the volumes were assessed to ascertain different phases of compilation and the reassessment of the samples over time. These methods were then

compared to those within other sections of his living and cabinet collection to understand parallel methodologies and thus link the collections in ideology.

Assisting the analysis of the *hortus siccus*, Constable's available correspondence has also been consulted, along with thousands of bills of purchase accumulated by him during his lifetime. In some cases it has been possible to understand the provenance and construction of the pressed plant collection through references in the correspondence, notations in the herbarium itself or indirectly through these seed and plant bills. When investigated in the context of his wider garden developments and extensive collection building, Constable's fascinating endeavours make definitive links between landscape aesthetics, living plant collections, growing technology, cabinet collections, scientific experiment and social interaction. The evidence from Burton Constable will be discussed in each chapter, alongside the societal context and related case studies.

The currently available literature on topics related to plant collection will be reviewed in chapter two, where the case studies will also be introduced. Due to the nature of the study and its incorporation of a number of fields of influence, these will be discussed in varying levels of detail. The study of gardens, plants and associated spheres will be thoroughly investigated in order to present a critical picture of the current state of research and perspectives on the topic. The influencing agents of scientific thought, collection, curiosity, wonder and religion will be presented as a less critical synthesis of currently accepted approaches. The wider estate landscape and garden will be discussed in chapter three, providing a background to the study through the most widely researched and understood perspective on garden-making of this period. While landscape-based viewpoints are widely documented, recent discussions which consider the division of space within garden areas and the use of plants within them enable a framework to be built in which the plant collections are set. It is argued here that there is a distinct divide between plants and exotics used for large scale decorative effect in the shrubbery and flower garden and those used as choice specimens in the botanical garden or hot house, dividing the pleasure ground within a discussion of plants as living collections.

The specimen or botanical garden is the subject of chapter four, the arena in which living plants were cultivated for curiosity and investigation. While hot houses and specimen plants are acknowledged features of a number of eighteenth-century gardens, their ephemerality has led to a dearth of investigation into their contents, purpose and relationships, both to the wider garden areas and to collections of wonder or science. In chapter four the discussion will consider the investment into gardens of this kind in terms of money, time, knowledge and intellectual endeavour in order to establish the concept as a meaningful component of the eighteenth-century estate, albeit one of which the scale in the UK is not yet fully understood.

The introduction of the notion of scientific endeavour within the garden, typified by the living collections, necessitates a broader consideration of the scientific context. In chapter five, the scientific background of the eighteenth century will be discussed, specifically the approaches to natural history and philosophy, and the rise of botany as a discipline and occupation in its own right. Of particular interest is the fluidity of arenas of operation in scientific knowledge building, including the rise of professionalism, the proliferation of learned societies and the role of the gentleman amateur. The relationship between natural philosophers and *virtuosi* or amateurs will be discussed in the context of plants and botany, partly as agents of scientific adoption and emulation by the gentry, but also to inform an understanding of the elite's complex and active role in knowledge building through their wealth, land and resultant ability to provide the conditions and resources for experimental cultivation. This is not an area of study which is commonly associated with plants and gardens, but it is argued here that an understanding is vital in order to correctly assess the objectives and ambitions of garden owners, as well as gaining an understanding of how domestic gardens and collections were active agents in the process of knowledge development of the period.

Following a discussion of the scientific context, the process of this scientific endeavour with regard to plants and collectors will be considered in chapter six. The concepts of both living and dried plants as cabinet collections will be set in context and it will be argued that they were part of the multifaceted eighteenth-century tradition of scholarly, scientific and specialised collecting which grew out of the seventeenth-century cabinet of curiosity. The distinction is meaningful in defining plants as active agents of knowledge in the eighteenth-century garden, as opposed to passive objects of wonder in a curiosity cabinet. This discussion connects plants with the wider traditions of collecting and provides a model by which to understand the living collections discussed in chapter four, and the dried collections discussed in chapter seven.

A significant proportion of the vegetative element of eighteenth-century plant cabinet collections was not made up of living plants. Plants were collected and pressed, often mounted on to paper to create what we would now recognise as an herbarium specimen. These samples were often bound into large volumes which were referred to as a *hortus siccus* - literally 'dry garden'. The process created a permanent record of plants successfully cultivated and allowed the classification of plants which were not available as living specimens. Similar motivations surrounded the alternative permanent imaging of plant samples including paintings, and in the case of Mrs Delany, paper mosaics (Hayden, 1980). While intended as a more enduring record these artefacts are vulnerable and therefore ephemeral themselves, but surviving examples provide a new perspective on the relationships between living plant collections in the garden, and cabinet collections kept within the house. Chapter seven includes a discussion of the Burton Constable *hortus siccus* and flower paintings in detail, and explores the link between these, the garden and the cabinet.

Within each chapter the relevant evidence from Burton Constable will be discussed alongside related case studies. Further case studies have been selected to be informative of the breadth of plant collection in the eighteenth century and to provide an historical context. Contemporaries of William Constable have been selected from collectors of the gentry including Margaret Cavendish Bentinck, the Duchess of Portland (1715-85) of Bulstrode, John Stuart, the Third Earl of Bute (1713-1792) of Luton Hoo and Highcliffe Mansion, and Charles Hamilton (1704-1786) of Painshill. In addition to those elite contemporaries are discussed individuals who are perceived to have been operating at a more professional collector or botanical level, including botanist Richard Richardson (1663-1741), Sir Hans Sloane (1669-1753) and Dr John Fothergill (1712-1780), who provide contemporary examples of fascinated collectors who were not of the gentry, but who were men of science. One significantly earlier case study, the Duchess of Beaufort (bap. 1630-1715) of Badminton, provides a perspective on how the plant cabinet tradition transformed from one of wonder, to one of knowledge. While the secondary case studies will form the main portion of the comparison with Burton Constable, further examples will inform the discussion including George William, the Sixth Earl of Coventry (1722-1809) at Croome Court, Robert James, Eighth Baron Petre (1713-1742). Marmaduke Tunstall (1743-1790) of Wycliffe and Henry Hoare (1705-1785) of Stourhead.

The case studies have been selected for their breadth, but also for their availability. Knowledge of living and dried plant collections is limited due to the poor survival of evidence and the resultant low availability of suitable material. While there are significant possibilities for furthering our knowledge of plant collection case studies through the interrogation of archive material, it was not within the scope of this study to do so. The apparently extensive collections of Lord Petre of Thorndon Hall, for example, are not well-documented. Therefore, the availability of published material partially dictated the selection of the case studies identified above. All secondary case studies are based on the published material, with the exception of the small, surviving sample of the Duchess of Portland's *hortus siccus* and flower paintings which were documented at Welbeck Estate by the author with the kind permission of the curator. It is hoped that together, these case studies form a relevant picture of the tradition of plant collecting in the eighteenth century, and will encourage further research into the lesser understood examples.

The above case studies are intended to provide a useful cross section of living and dried vegetative collection building, including both amateur and professional participants. They also provide examples of instances in which plant and exotic collections were used as features in the landscape, shrubbery and flower garden, but for which there is no evidence of use as a cabinet collection. Exotic plants created a frenzy of excitement which exploded in new theatres of display, modes of study, development of technologies, furthered social and political options, and increased economic opportunities. They were an accessible entry point into the world of

eighteenth-century science as they did not require access to complex scientific instruments and were seen as appropriate study material for ladies. Taking a holistic approach to the study of plants and gardens will enable a more thorough understanding of how flora was viewed and consumed in this period.

In the eighteenth century, science, art, society, scholarship and pleasure were interwoven, and it is this concept which will be explored in this research. It will attempt to tease out distinct strands and trends, while acknowledging how the disparate nature of the study and enjoyment of exotics was rarely uniform across collections. It is worth noting at the outset that the aim of this thesis is not to create an overarching model or generalisation which could be applied to gardens of the period. To do so would undermine the diversity of the genre, the individuality of the personalities involved, their social and professional circumstances, and the means they had to cultivate and collect. The aim is rather to provide an alternative perspective on the cultivation of plants and exotics, to build an understanding of the purpose of 'botanical' areas of gardens, to understand how gardens were influenced by the traditions of knowledge and collection building, and to discuss how the plant collections of the gentry were an active agent of cultural transformation in the eighteenth century.

CHAPTER 2: LITERATURE REVIEW AND CONTEXT

"Tis there we see thee, Bobart, tend
Thy favourite greens; from harms defend
Exotic plants, which, finely bred
In softer soils, thy succour need;
Whose birth far-distant countries claim,
Sent here in honour to thy name.
To thee the strangers trembling fly,
Or shelter from our barbarous sky,
And murdering winds, that frequent blow,
With cruel drifts of rain or snow;
And dreadful ills, both Fall and Spring,
On alien vegetables bring."
(Evans, 1789, p. 13) Extract from Abel Evans' Epistle to Dr. Jacob Bobart

The poem from which the extract above is taken was written in 1713 by clergyman Abel Evans and dedicated to the botanist Jacob Bobart (1641-1719), superintendent of the Oxford Physic Garden in the late-seventeenth century. It highlights the social status attached to growing newly-discovered exotics and the difficulties of protecting them from the British climate. In speaking of the practicalities of tending plants, the poem reminds us of how little we understand of the day-to-day consumption of plants in eighteenth-century gardens. The immense investment of money, time and infrastructure required to bring these specimens to a successful and enduring state of cultivation is testament to the status they held and their perceived transformative potential.

In order to understand plants as curiosities and as components of a cabinet collection, it is necessary to bring together a number of spheres of research which are often disconnected in modern scholarship. Considerations of gardens, knowledge, collecting, plants and society frame this study, the aim being to combine this multidisciplinary approach into a broad-based discussion of plants as collections. The context of garden aesthetics forms the outdoor arena of engagement; within the garden plants were used stylistically, functionally, botanically and for exhibition. Therefore, a discussion of the composition of gardens is necessary to ascertain where a knowledge-based collection may differ from one designed for show and status, and to examine where plant collections may overturn the fashionable norm by interrupting a landscape. The plants themselves are also central agents in this investigation, their collection, dissemination and cultivation all contributing to our understanding of the significant investment and endeavour required to achieve a notable collection.

Plants and gardens are not surprising bedfellows, but these two rarely come into scholarly contact with the other vital elements of our analysis; collection and knowledge. It is this division of spheres which has so far hindered the analysis of plants as scholarly collections; the division between the indoor and the outdoor is a barrier which is not often crossed in this area of historical research to the detriment of the botanical garden, the herbarium collection and the wider curiosity cabinet. This chapter reviews the current research which frames the discussion within the above spheres of study. A review of the relevant literature will be followed by an overview of Burton Constable during William Constable's occupation of the hall, alongside an introduction to the major case studies to be used throughout.

GARDENS

In order to understand the horticultural context in which this study of plants and collections is set, it is important to consider the stylistic context in which they existed. Wider garden influences and trends were clearly linked with, encouraged and limited plants and their use. Equally, a new reading of the botanical residents may help to shed new light on the structure and function of these spaces. Gardens were influenced by, and were creators of a variety of social and political trends during the eighteenth century, and their subsequent study from then until the present day has been no less dynamic. This study aims to place the botanical cultivation of plants within the structure of a landscape garden at Burton Constable, and thus create the possibility of new readings of the use of space when considering landscape gardens in the future.

The study of gardens in history is, by its very nature, different from the historical study of other forms of art, craft and architecture due to its particularly ephemeral nature. Developments in architecture and country houses are usually traceable due to their solidity and rigorous planning, but gardens were regularly overhauled to make way for the next fashionable style and often left less enduring trace. Estate papers and account books often contain details of plant lists and building methods but these records provide an incomplete picture of many of the eighteenth-century landscapes which are so familiar today.

The problem of incomplete representation is compounded by the persistence of influence of late eighteenth-century publications on gardens with a political and patriotic agenda, notably Horace Walpole's (1780 [1995]) *The History of the Modern Taste in Gardening*. Walpole's celebration of England's invention of a modern and natural style of gardening, and his satire of formal styles which came before it led to a subsequent bias in garden study (Laird, 2015, p. 3). His emphasis on the superiority of the landscape style endured to the point that it became the cornerstone of the study of English garden history for the next 200 years. In his *Greater Perfections*, John Dixon Hunt (2000, p. 208) states that Walpole's writings "single-handedly…

determined (or distorted) the writing of landscape architecture to this day" by discrediting formal styles, and arguing for the supremacy of the "natural, modern and English". Laird (2015, p. 3) identifies that this was later compounded by the division of natural historical disciplines in the nineteenth century, separating botany, ornithology and entomology among others from the science of horticulture.

This historical bias, alongside the ephemerality of evidence has led to the omission of vital nuances from the study of the eighteenth-century garden, the smaller purchases, the techniques employed, the aesthetic of the planting design and the even more ephemeral plant collections. Design-based and stylistic conclusions are drawn readily, while the finer details of garden use and ideology remain relatively elusive. Brent Elliott (2012, p. 66) has highlighted the dominance of design histories along with the lack of attention given to the practicalities of horticulture; the tools, plants, buildings and gardeners which are central to a representative study of historical horticulture. He has also highlighted the influences of varying historical approaches which have often been applied to the study: chronological, nationalistic or art historical (Elliott, 2012). Publications in this vein such as *The Story of Gardening* by Penelope Hobhouse (2002), *History of the Garden* edited by Loxton (1996), Aben and Wit's (2001) *Hortus Conclusus*, and Elizabeth Barlow Roger's (2001) *Landscape Design: A Cultural and Architectural History,* provide a useful historiographical background to this research but are limited in their study of more detailed horticultural activities. Comparison to linked fields of study, including the natural sciences is limited, although more analytical and broader perspective studies can usefully frame any study of garden history.

Positively, the past two decades have seen a shift towards explorations of wider themes with an increased analytical focus. Williamson (1995) and Turner (2005) have introduced social and political context to the debate alongside the generalised changes in spatial design, allowing increased cross-discipline comparison. Explicitly theoretical works have also proliferated, tending to focus on an artistic or socio-historical topic and touching on plants only briefly, and their contribution is welcome. Theorisation presents useful perspectives on the issues of the view of the tropical, environmentalism and the use and experience of gardens. Michel Conan (1999, 2002, 2005), John Dixon Hunt (1997, 2000, 2004) and David Cooper (2008) have all made impactful contributions to this field, framing various new perspectives on garden history.

Dixon Hunt's *Greater Perfections* (2000) aims to provide a new historiography of garden history, outlining ways in which gardens can be more holistically studied and understood, and provides suggestions for new directions in which the study of the history of landscape architecture could be shaped in order to correct the Walpolean bias and create a more rounded and representative picture. Based in landscape architecture, Dixon-Hunt's arguments are predominantly focussed on a grand scale, and are concerned with place-making, people and experience, also offering

useful concepts to the study of more intimate garden activities. These include his suggestions to embrace the diverse nature of garden forms, and the need to consider garden history as a distinct field of study in its own right, rather than a theoretical offshoot of architecture or art (Dixon Hunt, 2000, pp. 216-217). The perspectives of these garden theorists encourage new approaches to, and wider perspectives on historical gardening. They allow broader contextual studies to occur and develop which take in the more granular details of pleasure grounds including plants and cultivation.

The landscape style was predominant in the mid- to late-eighteenth century and represents a peak in landscape investment and social power, therefore much time has naturally been spent analysing the work of Lancelot 'Capability' Brown and his broad contemporaries. Many sources have documented the movement including Hadfield (1977) and Jacques (1983), focussing on stylistic characteristics and the form of the garden, and Mowl (2010) has offered a study of their creators. The movement is often considered as a celebration of the landscape, and an attempt to produce an idealised view of nature. A homogenous view of this interpretation of the landscape style has often dominated the historical conversation, to the detriment of the recognition of individuality and diversity within gardens. More recent interpretations, however, have shied away from a monotypic rendering of the popular landscape tradition. Michael Symes' (2016) *The English Landscape Garden in Europe*, for example, identifies no less than seventeen variations on the landscape style based on both practical and ideological variables. Furthermore, Williamson (1995, p. 3) advises against considering a static concept of nature in eighteenth-century design, the term being defined in different ways at different points throughout the century; notions of the completely natural, and of landscape design, were never synonymous.

This fresh interpretation of the landscape style as a variable concept provides a solid background for this thesis. Perhaps the most helpful definition is offered by Symes,

> "The term 'The English Landscape Garden'... does not apply to one single type of garden but rather to an approach to garden design which at different times in the 18th century emphasised different aspects and elements, though all broadly in a style that can be described as naturalistic" (Symes, 2016, p. 1).

Symes' approach to the landscape garden realises Dixon Hunt's (2000, p. 216) aspiration that a broad range of influences should be acknowledged when discussing landscape style. This in turn builds on Tom Williamson's (1995) assertion of the same view in *Polite Landscapes*. Williamson was a pioneer of widening the social context within which the study of gardens is situated first in *Polite Landscapes* (ibid.), and then with David Brown in *Lancelot Brown and the Capability Men* (Brown & Williamson, 2016). *Polite Landscapes* effectively produced a

consideration of the impacts of politics and economics, farming and forestry and changing patterns of social organisation, including polite society, on garden making. Williamson (1995, pp. 1, 5) advocated an interrogation of a broad range of evidence in order to create a more complete picture of garden histories, and suggested that the history of gardens is as complex as that of society itself, thus their study should be firmly based in a social context from the local to the global.

Williamson (1995, p. 7) further warns of a reliance on the often-referenced 'key sites', including Stowe, Rousham, Stourhead and Painshill, which are individual gardens created by the particularly wealthy, and therefore not necessarily representative of a broader reading of eighteenth-century ornamental landscapes. He stressed the persistence of the geometric style into the middle of the eighteenth century (ibid., p. 68), in addition to the agency of the owner in the creation of particular gardens. Owners often took control of the design of their outdoor spaces or were the ultimate decision maker in consultations with a designer (ibid., p. 7). Following the concept of gardens as individual creations, Williamson (ibid., p. 66) went on to emphasise the role of the garden as a creator of identity, not simply a reflection of it. He discussed the role that landscapes played in representing political and ideological identities, and identified the trend for garden tourism in the seventeenth and eighteenth centuries which mobilised this message from static landscape to wider society. These theories of identity are particularly relevant here, providing a garden-based context in which to address the issue of collection-based identity building which will be discussed in later chapters.

Of particular relevance to this study is Michael Symes' (2016, p. 1) identification of enlightenment ideals and the study of botany as significant drivers in the move to a landscape style from earlier geometric designs. These views reject the stylistic generalisations which had often been present in studies of garden-making in Britain and emphasise the individuality of spaces, an approach which will be a central feature of this thesis. The stylistic work concludes that while many gardens did follow trends, many did not, or did so selectively. Many gardens were much more understated and individual creations, established on their owner's likes and dislikes, responding to differing economic and social priorities and adopting new trends and fashions on their own terms. They also adapted to their site and situation, taking advantage of topography and the varying English climate to create individual spaces of differing design. These were influenced by the style of the day in that it is almost impossible to not be influenced by a structure in which one exists, however, not all were constrained by it.

Mark Laird has been a pioneer of fresh modes of enquiry into gardens of the eighteenth century. The study of the composition of plants in gardens and the varying use of garden areas was elevated to a new level by his *The Flowering of the Landscape Garden* (1999). The book goes further than any other to date in considering the use of plants in eighteenth-century pleasure

grounds alongside the landscape design of the day. It focusses particularly on shrubberies and flower beds, considering the use of plants within these spaces, the type of plants used in particular situations, and most importantly for this study, the varying use of different garden areas. Laird's views are extensively supported by detailed case studies of individual gardens, of which Burton Constable Hall is one. Throughout the work reference is often made to the 'botanical' gardens of private individuals, a concept which will be expanded here. Few other studies marry the worlds of design and planting so thoroughly, making Laird's work particularly useful to the first four contextual chapters of this thesis by providing a structure for differently used and understood garden areas within an eighteenth-century estate.

PLANTS AND BOTANY

The history of plants in the eighteenth century is inextricably linked with exploration and colonial expansion. While these will not be central themes of this thesis, it is important to acknowledge the social and economic backdrop they provide. The proliferation of work on plants, botany and colonialism over the past three decades has significantly increased our understanding of the importance of plants in empire building. This enabled Batsaki, Cahalan and Tchikine (2017, p. 4) in 2017, to confidently state that the knowledge and exploitation of plants became a fundamental instrument of imperial expansion and government control, and that eighteenth-century naturalists were "agents of empire". These statements advance the importance of the culture of botanical and horticultural scholarship in Britain in the eighteenth century, in turn highlighting gardens and plants as prominent societal vehicles. As such, a fresh perspective on plant collections is required in the context of the history of the scientific process and the history of collecting.

The function of plants was often recorded during the building of a collection and clearly had an impact on species selection. Many collectors were individuals concerned with medicine, trade and agriculture, and so plants featured heavily in their professional and economic success. Tea, sugar, coffee, rubber and spices were building blocks of empire, and it is worth noting the personal and national wealth being forged on the basis of botanical material. Botanical gardens became spaces for the experimentation and exchange of economically valuable plants, and commercial exploitation was made made increasingly possible by the expansion of administrative networks and improved technology (Batsaki, Cahalan and Tchikine, 2017, p. 6). The economy of plant collection and exploitation at this time was so significant that Londa Schiebinger (2004, p. 7) refers to eighteenth-century plants as 'green gold'. New medicines derived from plants were very profitable and influential in the lives of many, particularly those enjoying a higher social status. This cannot have failed to influence the manner in which plants were approached for interest and collection. A class of object so central to a society's success is naturally an object for study, especially at a time when new discoveries were numerous.

Being so intimately linked to the colonial economy through trade and agriculture noted above, plants were imbued with a power that was felt throughout Europe. Plant collection was seen as an integral part of world exploration, and the possibilities were potentially transformative. Botanical gardens curated and shared the new-found knowledge which was constantly on the increase. The subject of botanical gardens is well-documented, most recently in the context of empire by Baber (2016) and in the context of horticultural knowledge by Spencer and Cross (2017). Baber considers botanical gardens as sites for the consolidation of knowledge and empire; they were the "structural context for the development of new forms of knowledge, practices, institutions and power (Baber, 2016, p. 659). Spencer and Cross (2017) consider botanical gardens in the context of the scientific revolution, the Enlightenment and the consumer revolution, considering the contribution of gardens to knowledge and social change. It is against this backdrop of the new and the eagerly acquired and cultivated that private collectors enter the frame. An awareness of the wealth generated by plants and the global domination they enabled would have been set squarely in the minds of many who cultivated plants within their landscapes, and who collected dried specimens sent directly from overseas.

When considering both these living and dried plant collections in a domestic context, their ephemerality poses difficulties. The abundance of available evidence for more enduring landscape elements means that vegetative material can easily be overlooked. Writing on the subject is abundant; there exists a reasonably comprehensive understanding of plant collecting expeditions and their participants (Lemmon, 1968; Musgrave, et al., 1998), the nature of the plants' passage back to Britain and the generally agreed dates of introductions of particular species to the country (Grimshaw, 1998). A reasonable amount of evidence and factual study exists for the sheer effort and investment inherent in encouraging fragile plant specimens to thrive in the alien climate of Britain, but discussions of the underlying motivations and social context are less prolific.

With regard to the acquisition of specimens, the trade and movement of plants during the colonial period is most comprehensively considered in Taylor's *The Global Migrations of Ornamental Plants* (2009). Taylor studies how plants arrived in different countries and touches on how they were perceived and naturalised over time. She catalogues movements, but does not go into detail about the manner of movement or how plants were utilised in gardens and landscapes. Taylor identifies different waves of plant introductions into Britain: an American phase from the 1580s to the 1820s, followed by increasing introductions from Asia, the Far East, the southern hemisphere, South Africa and eventually China and Japan. Campbell Culver's (2001) *The Origin of Plants* thoroughly catalogues plant introductions to Britain over the past one thousand years, whilst also providing a societal context. Both of these works provide invaluable reference material for further analytical investigations into the complexities of the consumption of plants post- arrival and dissemination.

The proliferation of plant introductions led to a boom in the nursery trade, a subject on which John Harvey (1974) was a pioneer, and whose publications in the 1970s and 80s remain the definitive works on the functionality of the industry. His studies do not discuss the sourcing of plants in detail or the horticultural methods employed in the nursery, but are an excellent starting point to generate an understanding of practicing nursery sites and to enable further study. Clark (2012) identifies the prominent role of the nurserymen in the control and dissemination of new plant specimens to England in the eighteenth century, concluding that the speed and effect of the construction of the landscape garden would not have been possible without their specialist skills. The nurseryman can therefore be considered a prominent figure in both plant collection and garden creation. Other useful sources include occasional papers or booklets on individual nursery case studies, such as David Solman's (1995) excellent overview of the Loddiges' nursery, and Maddison's (2005) case study of the Callender's northern nursery.

Together, the studies above provide a useful business context of the nursery trade, but the most useful to this discussion is the recently published *Cultivating Commerce* (Easterby-Smith, 2018). Easterby-Smith revises traditional historical accounts of the nursery trade by demonstrating the extent to which it influenced the cultural appropriation of botanical science within the middling and upper classes of the UK and France. The work represents a leap forwards in the study of historical botany, outlining commerce and consumption as active agents for the promotion of social participation in science, securing their connection to the wider social and cultural transitions experienced in enlightenment Britain and France. Easterby-Smith's work allows the plant trade to be viewed in a different role to many past interpretations and should shape future study of the history of botany and plant trade networks.

Many other authors have struggled to ally the fields of botany, gardening and horticulture in a broader analysis of gardens in the past. Penelope Hobhouse (2002) devoted a chapter to 'Botanists, Collectors and Artists', charting how plants were introduced into England, how they were purchased by enthusiastic plantspeople, recorded in florilegia and cultivated in botanical gardens. Chambers (1993), likewise, noted the horticultural capabilities of plantspeople including Lord Petre, the Duke of Argyll at Whitton, and Mary Capel Somerset, the Duchess of Beaufort. He also provided a useful chapter on botanists, gardeners and designers and is one of the first writers to discuss plants as botanical curiosities, although the work is very much centred on the concept of the landscape garden, considering botanical influences as subsidiary. These thorough overviews provide a solid base for further study of plants in the context of wider societal collection and trends, recognising the influence of a broader scientific context.

While the link between the historical spheres of horticulture, gardens and botany is not well developed in literature, the link between gardens and botanical collections is even less

thoroughly understood. The keeping of herbariums in relation to an interest in gardens features briefly in Chambers' (1993) *The Planters of the English Landscape Garden*, but the subject is not explored in detail. In general scholarship, plants are often overlooked in the consideration of curiosity and philosophical cabinets or mentioned only in passing. Arthur MacGregor's (2015) edited volume on the Cobbe Cabinet of Curiosities is the exception, containing a chapter by Charlie Jarvis on the herbarium specimens, although the collection is slightly late in date for comparison to this discussion. Again, the most relevant work to this discussion is Easterby-Smith's (2018) *Cultivating Commerce*, which sets the cultivation of living plants and the resulting study of botany against the relevant enlightenment backdrop of collection and its associated consumer culture. Taking this broader view and considering the history of plants in parallel with a history of knowledge, science and collecting will allow this thesis to achieve a wider societal context, and shed new light on the uses of eighteenth-century gardens and their vegetative inhabitants.

KNOWLEDGE, SCIENCE AND COLLECTING

Studies of collection, science and knowledge form the foundation of this discussion of plants as intellectual objects which will be the focus of chapter five. An understanding of how knowledge was considered by the upper classes of society feeds directly into an understanding of cabinets, and a new perspective on botanical collection. The exploration of new worlds, improvements in technology, the popularisation of scientific thinking and increasing freedom of philosophical thought led to an explosion in the study of natural history in the eighteenth century. While the term 'science' was not commonly understood in the way it is today, it is currently used in many cases to refer to the disciplined study of the world in the past, and the 'history of science' is an accepted field of enquiry. The term 'natural philosophy'[3] will be used in this study when referring to the study of the world in the eighteenth century. Allen's (1976) *The Naturalist in Britain* provided one of the first studies of natural history and philosophy in Britain. The history of science is increasingly being discussed in the context of the history of collections, an overview can be found from Zytaruk (2011), and Arnold's (2006) *Cabinets for the Curious* provides a thorough perspective on early museums and their scientific collections which have proved a solid basis on which botanical considerations can be set.

The more general knowledge-based themes to be drawn upon in this thesis, namely the histories of epistemology and science are well documented and understood in relation to the eighteenth century. The application of and influence of philosophical thought on the sphere of eighteenth-century natural philosophy provides a useful foundation for discussion. Judd

[3] Natural philosophy was the accepted term for science-based activities in the eighteenth century. In the seventeenth century the term natural history was commonly used, and in some cases persisted into the eighteenth century to describe the study of the natural world.

(2011) considers the definitions of natural science and how it evolved, also considering political influences. Others, such as Blair (2008) and Findlen (2008) consider the impact primarily on the natural sciences. Further works which apply these philosophies to other spheres of learning are also of use in assessing the implications of new science and epistemology on creative pursuits, for example Sambrook's (2014) work on the intellectual and cultural context of English literature.

Approaches to the history of science have recently taken what Zytaruk (2011, p. 1) refers to as "a material turn", correcting the previous bias on textual knowledge with increased attention on the spaces in which knowledge about nature was achieved. Without doubt, one of the catalysts of horticultural activity and plant cultivation in the eighteenth century was the proliferation of available texts which were relevant to the gentleman gardener. Blanche Henrey's (1975) *British Botanical and Horticultural Literature Before 1800* contains a comprehensive list of the horticultural works available to practitioners and gentlemen before the start of the nineteenth century, highlighting the wealth of information available to the grower. The subject is later picked up by Laird (2015, p. 133), who summarises the impact of horticultural publication on knowledge and the popularisation of the field.

The most startling omission in the discussion of plants and science, is the production of a work which explicitly discusses the relationship with reference to a number of case studies. Many works discuss the link within one garden or collection study, but scholarship has been largely silent on the wider context within the eighteenth century. One work which has started to bridge this gap is Mark Laird's *A Natural History of English Gardening* (2015). The book addresses many relevant issues including the quest for order in nature as part of garden-making, the production of images as part of plant classification, and the role of the *virtuosi* in these pursuits. Laird's work is made up of a valuable collection of brief case studies, each illustrating the relationships between individuals, their activities, and how these linked the outdoors with the world of natural history. He overtly avoids constructing a grand narrative within which his individual case studies sit, instead aiming to "present gardening and natural history in the early modern period as a 'horizontal diffusion' of artistic and scientific knowledge" (Laird, 2015, p. 23). Laird's work brings together many of the collections, collectors and other individuals who will feature in this study including Mary Somerset, Duchess of Beaufort, George Dionysus Ehret and Mrs Delany. One of Laird's major contributions is to highlight the significant role played by women in the study of natural history in the eighteenth century, as influential collectors and scientific patrons. He identifies a taxonomic impetus inherent in the collection of dried and living plant collections, particularly in relation to the collections of Mary Somerset.

Plants are often referenced by scholars of collections as integral parts of the cabinet and museum tradition, including Prest's (1981) *The Botanic Garden and the Recreation of Paradise,*

and MacGregor's (2007) *Curiosity and Enlightenment*. A discussion of the study of citrus fruit, fossil woods and flora in the seventeenth-century collections of Cassiano dal Pozzo, and John Evelyn's horticultural methods of classification are a central element of Zytaruk's (2011) article on cabinets of curiosity and knowledge organisation. Scholars of plants and gardens, however, rarely consider their subject as parts of collections – an approach which, given the rich seam of scholarship on collecting, may be effectively employed to add a further dimension of understanding to the study of vegetative material. The trend for collecting in the eighteenth century included not just traditional cabinets of curiosity, but also outdoor collections of plants in the flower garden and hot house, and animals in the form of the menagerie. The Georgian menagerie has recently been discussed by Plumb (2015) and Grigson (2016), and is also considered by Laird (2015, pp. 231-255). It is relevant to this investigation in the context of living specimens collected for purposes of curiosity, amusement and classification, increasingly considered as elements of the early museum.

A number of works have discussed collectors and early museums following Impey and MacGregor's (1985) volume on the origins of museums in the 1980s, whilst Evans and Marr (2016) provide a broad contextual overview of collection in Europe throughout the Renaissance and the Enlightenment. Recent studies include Arnold's (2006) *Cabinets for the Curious* which acknowledges the museum as a means of identity construction, the cultivation of prestige, knowledge building and the development of the meanings of material culture, and MacGregor's (2007) *Curiosity and Enlightenment*. MacGregor's (ibid.) chapter on museums and the natural world considers the history of natural history collections which contains a short section on botany and herbaria. These works offer excellent overviews of early cabinet collecting and place them within a vital social context, however it approaches the subject from the perspective of museum creation, and so perspectives on personal motives and ideologies must be sought elsewhere.

This gap is helpfully remedied by other works which approach the subject from different standpoints and are relevant to the study of the *virtuosi* collectors. Mary Baine Campbell (1999) discusses the development of science in conjunction with fiction, a reminder that the arts and sciences as we now define them remained entangled in allied fields of discussion in the eighteenth century. Campbell gives particular reference to the concept of wonder, positive in driving innovation and discovery, but also creating suspicion and even terror, driving a subsequent requirement for understanding, order and system (ibid., pp. 2-9). Campbell (ibid., p. 9) suggests that from the chaos of earlier exploration, a "newly stabilised worldview" had been achieved across class, gender and belief in the early eighteenth century through observation, literacy, and epistemology, allowing the pursuit of knowledge by amateurs to thrive.

These amateurs were frequently the wealthy gentry with an interest in science and curiosities, otherwise known as the *virtuosi*. Hanson's (2009) *The English Virtuoso* addresses the relationship between British art and science in relation to the *virtuoso* in the seventeenth and eighteenth centuries. The 'art' is predominantly the visual arts, however, and material culture and natural collections are not discussed in detail. The discussion frequently turns to a horticultural topic, activities recounted as happening in gardens and in relation to plants, but analysis flits tantalisingly round the edge of a consideration of plants as relevant artefacts. Nevertheless, Hanson identifies a number of themes which can be applied to the study of plants in this context, including the relationship of professionals, often medical professionals, to the world of the *virtuoso*, the culture of patronage which consequently emerged, and the involvement of the influence of Francis Bacon and the Royal Society on popularised natural science.

These relationships were not without purpose, and few have linked the concepts of collecting and identity building as effectively as Marjorie Swann (2001). She builds on Eileen Hooper-Greenhill's (1992) *Museums and the Shaping of Knowledge* which discusses how museums have occupied various cultural roles over the centuries, rather than remaining conceptually static institutions. Swann (2001, p. 194) identifies that from an early stage in the collecting tradition, ambitious individuals such as the Tradescants capitalised on the practice to exploit their employers' social connections and links with the new world to fashion their own identities and livelihoods. Also conversely, that Baconian natural history research was employed "to legitimate the self-consciously genteel collecting practices of *virtuosos* and the Royal Society" (ibid., p. 195). It is now possible to apply this mutually beneficial social role of collections to the study of plants, in order to consider them as an active social tool.

Within the study of the history of the collection and use of plants in Britain, the relationship referred to by Swann between the two main protagonists - the professional class and the wealthy patron and collector or *virtuoso*, is key. This relationship in the context of gardens and plants is not well developed despite a rich seam of evidence demonstrated in individual case studies, for example the relationship of the Duchess of Portland, Daniel Solander and John Lightfoot recounted in Stott's (2013) *Duchess of Curiosities*, and that of The Third Earl of Bute and his contemporaries such as Joseph Banks outlined by Coats (1975). These relationships which were woven around the acquisition, observation and analysis of both dried and living plant material will be a central consideration of this thesis.

Accounts of individual collections involved in these relationships and the creation of identity for their patrons are piecemeal and therefore the published material is swayed towards more impressive, complete and surviving assemblages. Nevertheless, many studies of individual collections provide excellent introductions to the consideration of plant collections in the

blended contexts of science, collecting and aesthetics. Munroe's (2011) study of the plant collections of Mary Somerset, Duchess of Beaufort, for example, provides a thorough summary of the collections as architectural spectacle, a collection of catalogued specimens, and as a tool to further botanical understanding. Likewise, Chambers' article on the duchess's collections highlights the methodical nature of her work, and considers her cataloguing and notes on propagation in the context of the new science, in addition to her social and professional links with Hans Sloane and George London, among others (Chambers, 1997). Links between science, society, identity and collecting are alluded to within the text of a wide variety of these individual case studies, the intention of this work being to draw them out in order to create a broader contextual study of the contribution of plants to this field.

The spectacle and experimentation of living plant collections is the most commonly discussed arena in which the social roles play out, however, the dried plant collections provided more longevity and detail. The *hortus siccus,* or dried plant collection, was a central tool of the eighteenth-century plant collector. Despite the proliferation of the *hortus siccus* during the seventeenth and eighteenth centuries, they are often referenced in passing in wider plant and garden histories, but neither their form nor their function has ever been comprehensively explored. Individual *hortus siccus* have been studied including the Cobbe Cabinet (MacGregor, A. (ed.), 2015), but a wider exploration of the tradition and its impact is lacking. Gill Saunders (1995) offers an history of the herbarium and its links to nature printing, almost as an addendum to her work on botanical illustration. Also, *The Pressed Plant* (DiNoto & Winter, 1999) covers paintings, nature prints and pressed plants, however, these are considered from an artistic viewpoint, rather than horticultural or botanical. The work contains information on the nineteenth-century plant collection, but does not cover the collection of specimens or paintings throughout the eighteenth century in any detail. In light of an understanding that plants held a key social role, it is time to put Kent and Allen's (1984) catalogue of the hundreds of known historical herbaria into context, and consider that they may have contributed more to their owners than an enhanced knowledge of taxonomy.

A similar picture is true of the history of botanical painting, as this and the *hortus siccus* often went hand-in-hand as a method of plant preservation. Gill Saunders' (1995) work on the history of botanical illustration covers the links between art and science, and the resulting influences on the painting styles. It does not, however, focus on the employment of plant painters by gentleman amateurs. Other works provide a clear chronology and examples of botanical paintings throughout history, including those by De Bray (1989), and Sitwell (1990). Many other works have been produced on botanical illustration, although often both groups focus on featuring beautiful works, rather than analysing the motivations and history in detail, for example Celia Fisher's (2011) *The Golden Age of Flowers*. Others provide overviews of an individual's work with a history, such as Calmann's (1977) volume on Ehret and many others

exist as catalogues of an individual authors' work. Due to the tendency to consider paintings from an art-historical perspective, their contributions to society and science more often occur within discussions of an individual's collections. They are used to great effect to support Mark Laird's discussions of the natural history collections of various individuals including Mary Capel Somerset, the Duchess of Beaufort and Margaret Cavendish Bentinck, the Duchess of Portland, as well as his consideration of the contributions of Thomas Robins the Elder (c. 1716 – 1770) and George Dionysus Ehret (1708-1770) to documenting the field. Certainly in comparison to the creation of a *hortus siccus*, a slightly different range of motivations surrounds the commissioning of a plant painting, including exhibition and endurance of achievement, lending a further richness to this discussion.

The following chapters will consider plants as an active social tool in the eighteenth century, uniting the context and substance of garden scholarship with theories of knowledge, science and collection. Considering plants as cohesive collections, both the dried specimens in a *hortus siccus* and the living examples within the landscape will enable a more comprehensive understanding of the role they played in eighteenth-century society. Undoubtedly they were integral to the popularisation of scientific thought at the time, and also beneficiaries of the urge to order, classify and transform. The relationships and social roles created and mobilised by their trade, cultivation and the associated sharing of knowledge had a significant impact on the individuals involved across class, nationality and gender. By considering these elements as a whole, we will take a step closer to understanding how the plant, and the garden, was truly a significant agent of social change. Burton Constable Hall provides a useful case study on which to base this new angle of discussion, due to the unusual survival of informative elements in its archives.

BURTON CONSTABLE

William Constable (1721-1791) of Burton Constable Hall, East Yorkshire, was a gentleman with a passion for collecting, for plants and for fashion. Over a period of almost forty years, he enhanced his house and garden to fit the fashionable taste of the day. He completed the addition of a suite of rooms doubling the depth of the main range of the house which had been started by his father, Cutbert Constable, installed modern sash windows throughout the hall, implemented interior designs by Timothy Lightoler and James Wyatt and commissioned landscape architects Thomas White and Capability Brown (Hall and Hall, 1991, pp. 16-17). He collected cultural, natural and scientific curiosities resulting in a collection which, unlike many of the period, remains remarkably intact despite a nineteenth-century sale of some library collections. A significant archive also survives in the East Riding Records Office, comprising letters, documentation and vouchers from Constable's life. These assemblages, along with

surviving landscape features and associated plans, form a unique collection to shed light on how landscape, plant cultivation and scientific collection were juxtaposed and integrated on this estate.

The literature on Burton Constable Hall and William Constable as its patron is scarce, although the plant collections are better documented. Elisabeth Hall published two articles, *Plant Collections of an Eighteenth-Century Virtuoso* (Hall, 1986), and *Mr Brown's Directions* (Hall, 1995) which together provide an excellent factual introduction to the plants and landscape of the country residence. The published information is enhanced by further detail, particularly of the scientific instrument collection, by her unpublished MPhil thesis (Hall, 1992). Unfortunately Constable's commonplace notebooks, which were used significantly in Hall's studies are now missing, so current scholarship on this topic is reliant on her account of their contents.

Further information on Burton Constable and its various owners is contained in a pamphlet which includes articles by Deborah Turnbull on '*The Making of the Burton Constable Landscape*' (Turnbull, 1998), and David Connell on '*The Grand Tour of William and Winifred Constable*' (Connell, 1998). Connell (2009) has also published on the wax, sulphur, plaster and lead casts taken from engraved gemstones, medals and ancient coins, providing a detailed insight into a specific part of the collection. Further information on the provenance of the collection is also provided by Connell and Boyd (1998) in their account of the part of the Constable collection which originated from the Ralph Thoresby museum. These detailed studies provide excellent factual accounts of the garden and cabinet contexts of Burton Constable Hall which are drawn upon throughout this thesis.

Burton Constable and the collections are discussed briefly within wider contexts in Mark Laird's *The Flowering of the Landscape Garden* (Laird, 1999), and Karen Lynch's article on Capability Brown in Yorkshire in the *New Arcadian Journal* (Lynch, 2016). Lynch discusses Capability Brown's directions at Burton Constable within the context of other Brownian developments in Yorkshire. Laird, however, places the plant collections of William Constable in relation to others of the period, marking out Constable as a particularly knowledgeable owner, and highlighting the tendency to purchase individual specimens without the evidence for planting exotics in bulk in a shrubbery (Laird, 1999, pp. 152-158).

Constable amassed a significant collection of natural and scientific curiosities between the 1740s and 1770s which he stored and displayed at his country home. The collection included an extensive set of scientific instruments in addition to antiquities and archaeological artefacts. He was particularly enthusiastic about natural history and avidly collected fossils, minerals, shells, sea creatures and preserved animals. Unusually these were stored in the attic of the house after his death rather than being sold or donated. Burton Constable Hall was established

as a country house museum in 1992 after its acquisition by the Burton Constable Foundation, and conservation of the house and collection has been ongoing ever since (Connell, 2009).

At the heart of the collection is a ten-volume herbarium which was collated by Constable over a period of about twenty to twenty-five years from 1742. Nearly 1,500 plants are preserved in the surviving pages along with varying levels of information on their identification and provenance. The structure of the collection and incomplete numbering system, discussed in chapter seven, suggests that the herbarium was originally more extensive, with some volumes now missing. Plants were a long-standing passion of Constable's and an interest into which he invested significant time and funds. Like many plant collectors and botanists of the period, Constable referred to this collection in the bookplates of the herbarium volumes as his *hortus siccus,* or 'dry garden'.

Of particular significance is how Constable linked his *hortus siccus* within the house, the plants within his garden and a desire to create an aesthetic and fashionable landscape. The evidence presented in the coming chapters will demonstrate that Constable was keen to both conform to the expectations of eighteenth-century landscape fashion and embrace new and emergent scientific horticulture. The collections show how Constable's living plant collections sprang from an impulse to collect, catalogue, order and study the world around him. Of note is how the living and dried plant collections fed each other, as well as Constable's difficult task of integrating a landscape garden with his interest in botany. It is rare to have such well-preserved evidence of scholarship, cultivation, collecting and contemporary landscape development within one estate.

BACKGROUND

Burton Constable Hall lies in Holderness in the East Riding of Yorkshire, about six miles from the sea in a relatively remote location near Skirlaugh (figure 1). The Constable family first purchased and began rebuilding the existing hall on the site in the 1560s (Connell, 2014, p. 4) and the family still inhabit the house today. An oil painting (figure 2) of the hall from c. 1685-8 shows the house, a walled courtyard and stables surrounded largely by trees. Cuthbert Tunstall (c. 1680 – 1747) inherited the estate in 1718 following the death of his uncle and assumed Constable as his surname (ibid., p. 5). Cuthbert produced children to two wives after his first, Amey Clifford (1705-31) died of smallpox at the age of 26. William Constable was Cuthbert's eldest son and inherited Burton Constable when his father died in 1747. William's half-brother Marmaduke Tunstall (1743 – 1790), from Cuthbert's second wife Elizabeth Heneage (d. 1766) later inherited the nearby Wycliffe Hall (ibid., p. 5). William Constable remodelled the house and park extensively from the time of his inheritance to his death in 1791 and it is his primary influence which continues to shape the character of Burton Constable Hall as it is displayed

today. Constable also rented a fashionable townhouse at 11 Mansfield Street in London until 1784 when he moved all of his concerns to his seat in the north.

Constable invested in the house itself and continued the refurbishment work started by his father, completing plans to double the depth of the house by adding a new suite of rooms on the west front (Hall & Hall, 1991, p. 16) and adding a new garden which could be viewed from the new range. Like nearby Burton Agnes, the hall remained in the Elizabethan style, rather than being demolished and rebuilt to the current fashion as happened elsewhere. Hall and Hall (ibid., pp. 12,16) suggest Constable's maintenance of the original style was to make clear his family's long lineage. His priority for expenditure was not exclusively the aesthetic and fashionable ornamentation of his dwelling. He also prioritised his collections of art and science, and invested regularly in books and luxuries like tea.

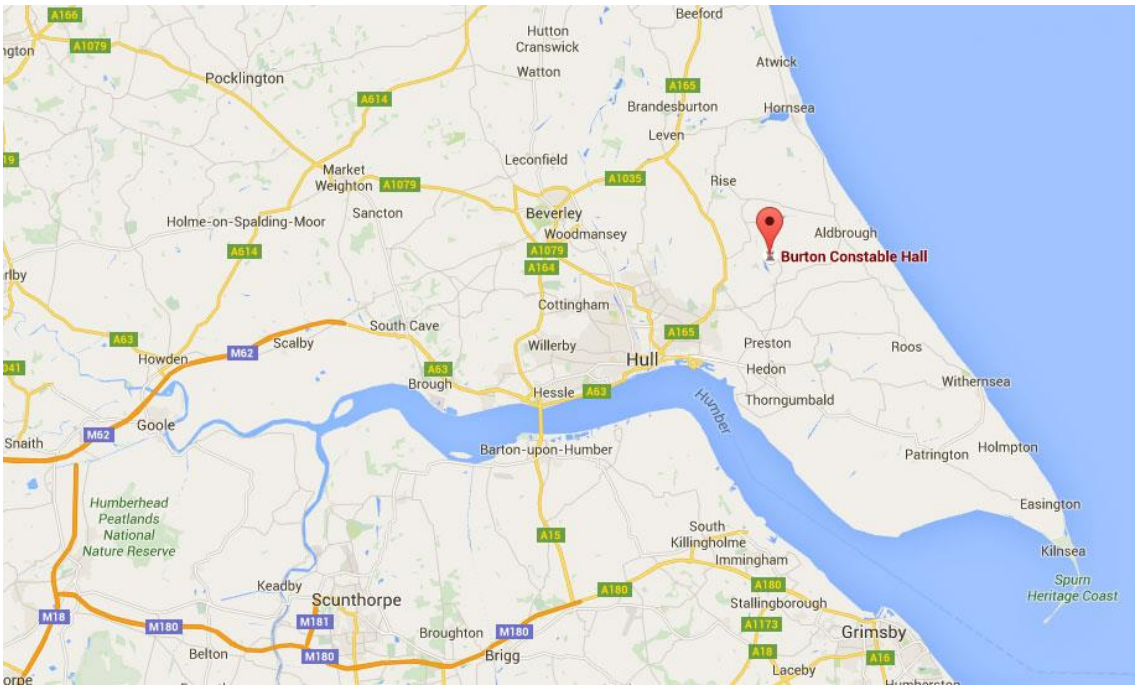


FIGURE 1: LOCATION OF BURTON CONSTABLE HALL (AFTER GOOGLE MAPS)

FIGURE 2: ANON. OIL PAINTING OF BURTON CONSTABLE HALL, 1690

The family was Catholic, so consequently Constable and his half-brother Marmaduke were unable to enter military or political occupations (Connell, 2014, p. 5) and were prohibited from holding public office. This would have limited their potential sources of income primarily to that from the estate, but spared them the expenses of a life in politics. Furthermore, Constable did not marry until the age of fifty-four, so short of managing his business affairs, he had a significant amount of time to pursue his own interests. He was clearly occupied by his heritage and identity - on a visit to the house, guests would encounter displays of family heraldry in the ceiling cove, chimney piece and furniture; learn from illuminated genealogical family trees mounted on rollers for ease of viewing, and meet generations of the family in the form of partly fabricated portraits of his ancestors which created a sequence of lineage from 1620 to William himself (Hall & Hall, 1991, p. 20).

Constable (figure 3) was educated at the Jesuit Douai college in France (Hall, 1992, p. 20), which may have influenced his scientific leanings, although no documentation on his life or correspondence remains from this time. Constable continued to conform to Catholicism, a letter to him from a curiosity supplier, dated 1760, whilst obviously pursuing a sale, identifies one view on reconciling religion and scientific study,

FIGURE 3: JEAN-ETIENE LIOTARD. WILLIAM CONSTABLE (1770) (PUBHIST, 2017)

"...each moment you contemplate the works of the infinite Creator, insensibly leads you with amazement and joy to the grateful knowledge of your Religious duty to that Supreme being: and conveys you through your life with that contentment and pleasure, only to be felt by those, whose principles are just and grateful". (ERRO DDCC/145/1)

The Catholic priest and natural scientist John Needham (1713-1781) tutored at Douai during this period (Arblaster, 2004), and Constable continued to correspond with Needham later in life. Needham developed his own evolutionary theories and was criticised for promoting materialism and atheism, although he challenged these criticisms as unjust and argued that a god could continue to exist within his theories (Roe, 1983). It is possible that Needham informed Constable's approaches to culture, scientific thought and the resulting collection and experimentation. Hall and Hall (1991, p. 19) suggest that Constable was almost certainly a Deist. He is known to have travelled to Paris with a tutor following his education at Douai, where he observed natural philosophy cabinets and experiments (ibid., p. 25). The trip was clearly a positive one for William, he later wrote to his stepmother to encourage her to send his younger half-brother, Marmaduke Tunstall, to Paris to improve his education by witnessing the experiments for himself.

His background and situation in life gave Constable an eclectic outlook. He once described his life thus:

> "My Employments are Reading and Reflecting, My Amusements the Management of my affairs, Agriculture, Gardening, Botany, Embellishing my Place with taste and propriety & Magnificence In which I Employ the best Artists of this Kingdom (Bodleian Library, MSS English Letters C.229 ff.125-6)

This self-portrait paints a picture of a gentleman who indulged himself in both the arts and the sciences, and who had a keen curiosity about the world as well as being eager to show off his good taste. Constable was a mentor to his younger half-brother Marmaduke who became respected as an ornithologist and collector in his own right. The brothers encouraged each other in their pursuit of the arts and the sciences, including natural history and discussions about garden plants. In a letter dated 1787 Tunstall wrote,

> "Some of our Melons have ripened tolerably, very few wall fruit of any kind, nor indeed can we expect them in this country to use an old phrase *communibus annis*... & indeed every bit of Attorney or Apothecary has his bit of stove" (Tunstall in Jessop & Boyd, 1999, p. 126).

This extract comes from a series of letters from Marmaduke Tunstall to William Constable which survive in the Bodleian Library, showing Tunstall to be an educated and affable gentleman. Around half of the letters are to William Constable, although others are to Joseph Banks, the English naturalist and botanist, and to Thomas Pennant, the Welsh naturalist, traveller and antiquarian (Jessop & Boyd, 1999). Tunstall's extensive social and scientific connections will be further discussed below.

William Constable married Catherine Langdale of Houghton Hall, but not until 1775 at the age of fifty-four, after the death of his sister and long-time carer, Winifred. Being a bachelor allowed him to pursue his interests and to travel, and he embarked on a grand tour from 1769 to 1771 at the age of forty-eight (Connell, 1998). His travels were partly an attempt at gaining better health through a warmer climate, whilst he also revelled in experiencing culture and collecting artefacts. Burton Constable Hall was furnished with the latest furniture, paintings and sculpture, many of which came from the tour. These included paintings of William Constable and his sister, plaster figures of Antoninus Pius and Sappho, wooden carvings and scagliola tables (Connell, 2014, p. 17). The tour also brought him links with the philosopher Jean Jacques Rousseau which he valued greatly, and which will be discussed in later chapters.

Constable strove to be a gentleman of enlightenment, science and culture, and it is these ideals which manifest themselves in his surviving legacy. His garden plans, plant collections and curiosity cabinet will be discussed in the coming chapters alongside extracts from his surviving correspondence, activities and estate records to build a picture of his indoor and outdoor collections, and how these contributed to his own interests and the creation of a social identify. To set William Constable and his endeavours in context, a number of his contemporaries and their collections are considered in parallel.

EARLY MODERN AND ENLIGHTENMENT PLANT COLLECTORS

When considering comparable collections and collectors, it must be admitted that one is not spoiled for choice. The ephemerality of collections, their tendency to be broken up and sold off after the death of a collector and the limited creation or survival of catalogues means that information on the majority of natural philosophy assemblages constructed during the eighteenth century is now missing. Add to that the necessity to discuss these collections alongside even more greatly ephemeral plant material, and garden structures which may or may not be recorded, and the pool of potential comparators shrinks again. The case studies presented are therefore selected primarily by the survival of physical, anecdotal or archive evidence for natural history collections, *hortus siccus* collections or living plant collections and should be considered with the caveat that most are likely to be the more spectacular examples of collections of their day. It is worth noting how many further collections and private botanical gardens must have been lost in the last two-and-a-half centuries.

Despite these inherent issues which surround the investigation of this subject, a number of case studies have been well-researched in relation to gardens, plants or collections and provide valuable evidence. The surviving picture allows a comparison with Constable's cabinet across geography, gender and social divide, but also across chronology. The earlier case studies allow a mapping of changing motivations over time, and are useful to compare with a wider understanding of the development of personal collections and museums. This allows the chronology of garden collections to be more effectively linked with the broader cabinet tradition. The relationships between case studies and their documented wider social circles demonstrate the scope of the practice of collection and the wider impact on society, attitudes and culture.

The earliest case study considered here is the garden and plant collection of Mary Capel Somerset, Duchess of Beaufort (bap. 1630 – 1715). Her activity dates a generation earlier than most other case studies discussed here; many of the influences remain similar, but outputs and motivations differ. Her early scientific approach to plant collecting and growth marks her out as one of the pioneers of her field, and it is notable that this was one area of intellectual life in which it was considered suitable for a lady to be involved. Somerset's second husband was Henry Somerset (1629-1700) who inherited the Badminton estate in 1660. He began a major building project on the house in 1664, and Mary concentrated her efforts on the gardens, building a large conservatory by 1678 (Kell, 2004). In 1681 the couple also purchased and remodelled a garden at Beaufort House in Chelsea, where Mary again shaped the gardens (Kell, 2004).

Mary Somerset developed a reputation for growing and flowering exotic plants and seeds successfully, often before anyone else had mastered their cultivation. She had an impressive

collection of plants from around the globe, which increased after her husband's death in 1700 (Kell, 2004). She had an extensive network of botanical and horticultural correspondents including the nurseryman George London and the botanist William Sherard who assisted with the procuration, identification and publication of her collection. A twelve-volume herbarium was left to Sloane after her death, and two illustrated albums recorded many of the plants in her garden, as well as information about their provenance and the treatment of them in cultivation (ibid., 2004).

Munroe (2011, p. 111) discusses the collections of the duchess as endeavours which crossed the fields of gardening, horticulture and botany, and highlights the scientific thought which informed her approach to plant cultivation. Munroe (ibid.) has accessed private family papers including letters to and from the duchess about plants, which provide an excellent insight into the collection. The insights from Munroe help to overturn previous theories of Somerset which have seen her as exclusively a collector (Chambers, 1997), an armchair botanist (Schiebinger, 2004, pp. 55-57), or eminently successful but reliant on male authorities (McClain, 2001). Certainly many wider studies, such as that of McClain (ibid.), have failed to recognise the significance of the pressed collections and paintings to the overall plant collection. Laird (2015) provides the most recent study of the duchess's collection, his perspective on the subject allowing him to make a rare reference to living plant collections in a hot house as part of a cabinet of curiosity (ibid., p. 90). Somerset was ambitious in her collection and influenced many of her contemporaries, therefore her early endeavours are pertinent to this discussion. The early date of the collection comparative to other case studies discussed here allows us to chart the changes in approaches to plant collecting from the seventeenth to eighteenth centuries, and to better understand the impact of the new approaches to the study of natural history which were brought by the eighteenth century.

One of the duchess's botanical advisors was Sir Hans Sloane (1669-1753) a physician, naturalist and collector who assembled one of the finest, and certainly one of the most famous cabinets in England. In 1687 he became physician to the second Duke of Albermarle in Jamaica; the two years spent on the island provided Sloane with experience of exotic surroundings and opportunity and enthusiasm for collecting (Hunter, 2012, p. 1) along with considerable wealth (Chakrabarti, 2012, p. 71) which assisted his collecting endeavours on his return to Britain. His collection was so extensive that it formed the basis for the British Museum when it was purchased for the nation by parliament after his death (Hunter, 2012, p. 1). From the professional class, rather than the gentry, Sloane provides an example of a wealthy and scholarly collector at a time when wonder was still fashionable, and allows a consideration of how collections may be used to increase an individual's social mobility.

Although there has been some rationalisation and loss of the Sloane collection following its establishment as the British Museum, the main body remains a well-preserved and accessible archive and includes catalogues which provide further valuable information. Of particular relevance to this study are the vegetable substances and extensive herbarium amassed by Sloane in his lifetime. The collection, currently housed in the Natural History Museum, comprises samples collected by Sloane himself, in addition to collections he purchased or which were donated to him. The eclectic nature of the collection therefore tells us much about collectors and their relationships as it does about Sloane's habits, as will be discussed further below.

Walker, MacGregor and Hunter's (2012) edited collection of essays on Sir Hans Sloane's collections addresses the many facets of the collection and surrounding context, including his connections, academic research, views and profession, alongside detailed overviews of discreet parts of his cabinet. This study followed an earlier overview of Sloane by Arthur MacGregor (1994), the subject of Sloane's collection being relatively well covered. Despite this extensive coverage of a collection, there remains a limited amount of information about the vast array of plants and vegetable substances in Sloane's collections (Jarvis, Spencer and Huxley (2012). Recently, a PhD project including Alice Marples and Victoria Pickering has worked on Sloane's plant collections, but has yet to be published. Sloane's collections form a useful study, being extensive and well-documented, in addition to being the mode of survival for many other individuals' collections which would otherwise have perished.

A contemporary of Sloane from the professional class, Richard Richardson (1663-1741) was a physician and botanist born in Bradford, West Yorkshire in 1663. His garden at Bierley Hall, which he inherited from his father, was rich with plants and in it he cultivated both natives and exotics. Richardson enjoyed excellent professional connections including Hans Sloane, and the botanists Dillenius and Petiver (Courtenay, 2004). His training as a physician, provided him with a scientific view of the world, an approach he applied to his study of plants. While little is written on Richardson from a biographical standpoint, he corresponded regularly with many of his contemporary botanists. Fortunately, much of the correspondence has survived and was published by Dawson Turner in 1835. While Richardson will not be a major case study, the series of letters provides a fascinating insight into his horticultural and botanical motivations and highlights significant parallels and similarities between his approach to the cultivation and collection of plants.

A generation later than Richardson, Dr John Fothergill (1712-1780) was a distinguished physician who similarly developed a particular interest in plants. Fothergill was born in Yorkshire, trained in Edinburgh and eventually set up a practice in Lombard Street, London (Jefferson, 1966, p. 637). Before his training in Edinburgh, Fothergill had been apprenticed to

Benjamin Bartlett, a Bradford-based apothecary, bookseller and Quaker minister who was an enthusiastic botanist and encouraged an interest in natural history (DeLacy, 2004). In addition to being a member of the Royal College of Physicians in Edinburgh, and the Royal Society of Medicine in Paris, Fothergill was also a member of the Royal Society in London (Jefferson, 1966, p. 638).

His early encouragement in the field of natural history and friendship with fellow Quaker Peter Collinson led to Fothergill becoming a great advocate of Linnaeus and a collector and cultivator of plants (DeLacy, 2004). He was in great demand as a physician, often working sixteen to eighteen hour days (Jefferson, 1966, p. 638), but despite his busy work schedule, he kept a sixty-acre estate with a five-acre walled garden at Upton in Essex (DeLacy, 2004) (Historic England, 2005). *Hortus Uptonensis* (Lettsom, 1783?), the catalogue of his garden produced after his death, along with his memoir (Lettsom, 1786) and further contemporary sources provide a valuable insight into the species cultivated and how they were used in the wider landscape. Unlike many of the other case studies which will be discussed, Fothergill was not a wealthy aristocrat or member of the gentry, he was an eighteenth-century self-made professional who gained notoriety for his skills. The discussion of cases such as Fothergill's allow us to set the collections of the 'elite' of the Enlightenment into a context of learning and scholarship, and to investigate the links between the two social spheres.

A contemporary of Fothergill but occupying a higher social status was the owner of one of the most significant botanical estates in the eighteenth century – Bulstrode Hall in Buckinghamshire. Margaret Cavendish Bentinck, the Duchess of Portland (1715-85) occupied the hall and shaped its grounds for fifty years, twenty-seven in marriage and twenty-three in widowhood (Festing, 1986, p. 195). She was the daughter of the second Earl of Oxford, whose extensive manuscript collection became part of the new British Museum (Campbell Orr, 2004, p. 172). Her fortune was significant and she devoted a substantial amount of time to developing her grounds and augmenting her collections of curiosities, art, natural history, animals and plants, in addition to becoming a noted bluestocking. Enthusiastic about collecting even before her marriage to William, Second Duke of Portland in 1734, she collected throughout her life with the fervour only increasing after the duke's death in 1755 (Hall, 2016, p. 58).

The collection is held to have been one of the most extensive and significant in the country, even larger than that of Sloane. It is less widely known and understood, however, as its contents were sold off after the duchess's death, the sale taking thirty-eight days to complete. The sale catalogue (Skinner and Co., 1786) records an extensive natural history collection which will be used in later chapters to place her plant collections in context. As the house and garden have been remodelled and are now in private ownership, there is unfortunately very little information on the style and content of the garden, but the evidence suggests a botanical

garden comparable to that at Burton Constable. The information available creates a clear picture of the garden and collection as being rooted in an intellectual ethos.

Similarly intellectually focussed, John Stuart, the third Earl of Bute (1713 – 1792) was a favourite of George III and served as the Prime Minister from 1762 to 63. Earlier in his career, following the death of Prince Frederick in 1751, Bute assisted Frederick's widow, Augusta to build Kew Gardens in the 1750s and 60s, overseeing the whole project for her (Coats, 1975, p. 20). He commissioned Robert Adam to build his house at Luton Hoo and Capability Brown to design the grounds in the late 1760s and early 1770s as his political influence was declining. He resigned as Prime Minister in 1763 following his negotiation of an unpopular peace with France and the implementation of a controversial cider tax, and then fell out of favour with his lifelong friend George III when in 1766 he protested the King's alliance with William Pitt, a political rival (Schweizer, 2009). Botany became his passion and on a trip to the New Forest he resolved to build himself a house on Christchurch Bay in Dorset, which he called Highcliffe Mansion. His new home, begun in 1773, contained two libraries, a laboratory and a natural history and fossil room (Highcliffe Castle, 2016).

Lord Bute dedicated himself to the patronage of literature, science and the arts, and collected prints, books and scientific literature. His political career and the inheritance of his wife following the death of her father in 1761 had left him one of the richest men in Britain and free to pursue intellectual life (Schweizer, 2009). At Highcliffe the earl cultivated rare plants in an impressive conservatory and grew hardy plants in a four-acre walled garden. Similarly to Constable, in addition to his impressive plant collections Bute desired a fashionable estate and commissioned Capability Brown again for advice on the grounds. Stuart provides an example of a collector who, blessed with high station, the most influential contacts and significant wealth, had the capacity to stretch his collection activities and personal expressions of scholarly identity as far as he wished.

Together, these case studies form as rounded a picture of plant collection in the early modern period as can be achieved with the currently available information. They will be supported by further examples including the collections of Archibald Campbell, the third Duke of Argyll at Whitton; those of Robert James, eighth Baron Petre at Thorndon Hall and Worksop Abbey; and Charles Hamilton's plantings at Painshill. The aim of this discussion is not to suggest that all gardens and collections of plants were intended as botanical collections, and so others will be introduced to the discussion which demonstrate planting for other means such as aesthetics and politics which are more widely investigated in current literature. The collections of these and other individuals may be usefully investigated further in the future to shed more light on the scale and scope of the collection of plants as natural history objects in Britain.

Considering Constable's collections alongside this selection of case studies which spans class, gender and time will allow us to chart the foundations of plant collection building in the eighteenth century and the relationships and motivations of those involved. Although survival of records is greater from the eighteenth century than the seventeenth, the evidence will also reflect the influence of the popularisation of scientific thought, the effect of the proliferation of published works and the subsequent rise of personal scholarship, and map the impact of this onto historical plant collections. By piecing together the fragmentary evidence from a variety of individuals, we will begin to understand the potential scale and spread of scientifically motivated plant collections in Britain, and may start to interpret the gardens of others with fresh eyes.

CHAPTER 3: EXOTIC COLLECTIONS IN THE LANDSCAPE

The vast quantity of exotic plants offered by eighteenth-century nurserymen and merchants were grown for the private estates of the wealthy. Branching out from the landscape-dominated garden scholarship of the past, recent publications including Williamson (1995), Laird (1999) and Symes (2016) have highlighted the diversity in use and the disparate motivations of the landscape garden in the eighteenth century. This fresh approach encourages a discussion of the different garden areas and the plants which would be used within them, however even Symes' (2016) seventeen sub-divisions of the landscape style only briefly acknowledge the importance of plants, and none define unusual or rare plants as a central agenda. The thriving nursery trade and proliferation of merchants and syndicates providing new and rare plants for sale suggest that the plants themselves were perhaps more of a significant motivation within a garden or park than is often acknowledged.

Laird's (1999) *The Flowering of the Landscape Garden* broke ground on this topic, highlighting the use of plants in different areas of a parkland and pleasure ground. Laird (ibid., p. 7) discussed Lancelot 'Capability' Brown's use of flower gardens and shrubberies, a departure from common discussions of his larger landscape elements dominated by grass and clumps of trees. He identified a tripartite division of the eighteenth-century garden: the wider landscape park for utility and scale, the pleasure ground for planted walks and enjoyment, and the flower garden where the choice specimens were kept (ibid., p. 12). The pleasure garden may have also contained a shrubbery, which as the name suggests consisted mainly of shrubs which sometimes included exotics, but equally sometimes did not.

Inevitably, the true picture is complex; gardens were directed by trends and fashions, often informed by a designer and ultimately dictated by the owner. This chapter will explore the wider landscape context of a selection of gardens which embraced plants as a core motivation, and how the new and the rare shaped or defined the structure and content of a space. It will consider William Constable's dynamic landscape at Burton Constable, noting the divisions in garden areas and their development over the decades of Constable's occupation of the hall.

Mary Somerset, Duchess of Beaufort (bap. 1630-1715) owned a significant amount of land surrounding her residence at Badminton House. During the 1660s before his death, her husband had purchased new parcels of land to extend their estate to over nine hundred acres (McClain, 2001, p. 116). Earlier than Burton Constable, the landscape style and many of the

examples discussed below, the duchess gardened in a geometrical style which lent itself to discreet garden areas, a style fashionable for the day which had been advised on by William Kent (Cottesloe, 1983, p. 20). Radiating avenues framed the house and cultivated area of garden, stretching widely into the landscape beyond. Her gardens included parterres, topiary, orchards, bowers and avenues of trees (figure 4). Within this she accommodated a stove and an orangery in which to cultivate her tender plants (ibid.). The space was complex, Laird has branded it "a veritable warren of enclosures that included a 'Current garden', a 'Mellon garden', a 'Phisick-garden' and all kinds of pens for rare fowl, guinea pigs and even 'tame foxes' (2015, p. 71). He has identified an estate map of the 1680s which noted eighty-one discreet garden spaces.

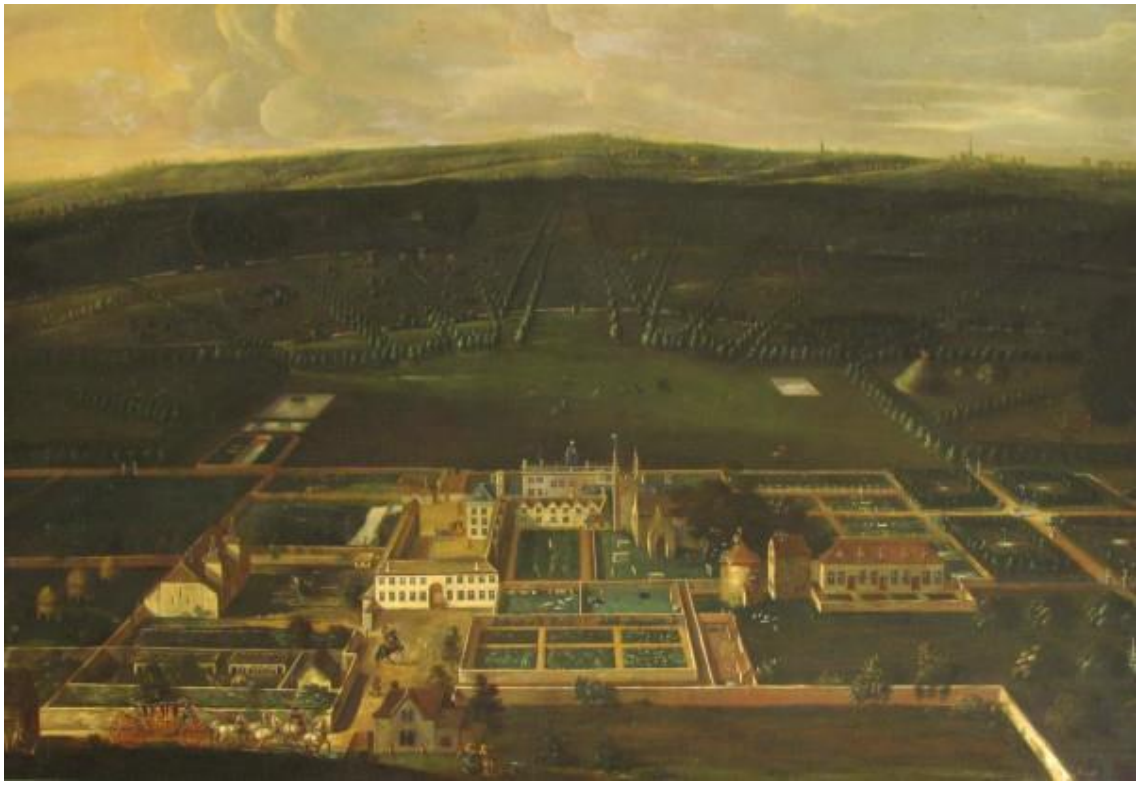


FIGURE 4: BADMINTON FROM THE SOUTH, ATTRIBUTED TO THOMAS SMITH, 1708 TO 10. THE IMAGE SHOWS THE EXTENT OF THE LANDSCAPE AND THE HEAVILY CULTIVATED AREAS AROUND THE HOUSE. THE GREENHOUSE IS SITUATED TO THE RIGHT OF THE DOVECOTE. AFTER (TODISCO, 2015).

Munroe's (2011, p. 112) investigations into Somerset's garden and plant collection have demonstrated that the number and extent of the plants cultivated at Badminton attempted to make a bold and architectural statement as memorable as the architecture of the house. Chambers (1997) has recorded a number of instances in Somerset's manuscripts in the Sloane collection which refer to the cultivation of plants as part of the landscape. The manuscripts include directions for planting trees in the country, and the grounds of the house included "stately trees" of *Platanus occidentalis*. Within the bounds of the cultivated garden the plantings were clearly diverse, numerous and valued. Stylistically, the duchess was free to

create discreet areas and microclimates, and to site her stove within easy reach of the house, prior to the sweeping vistas which would later come to characterise the park under Lancelot Brown and Thomas Wright.

Also relatively free from the open vistas of the landscape garden, but due to social position rather than chronology, was the physician John Fothergill (1712-1780). In August 1762 Fothergill purchased land in Essex at Upton, which he continued to add to over the years by purchasing adjacent land until it encompassed around sixty-acres. His five-acre walled garden was populated in part by the fruits of his friendship with Peter Collinson, merchant and plant trader who shipped many plants from the Americas to Britain via his relationship with John Bartram (DeLacy, 2016). The physician's garden held his collection of plants, including plants from China, the East and West Indies, Siberia and the Alps, North America and, according to Gilbert Thompson (1782, p. 20) in his memoir of Fothergill, "the new-discovered Islands, &c. and not a few from Africa, that stupendous garden of vegetable beauty". There is little information about the structure of the garden, although John Coakley Lettsom gave an account in his own memoir of Fothergill,

> "The walls of the garden inclosed above five acres of land; a winding canal in the figure of a crescent, nearly formed it into two divisions, and opened occasionally on the sight, through the branches of rare and exotic shrubs, that lined the walks on its banks. In the midst of winter, when the earth was covered with snow, evergreens were clothed in full verdure: without exposure to the open air, a glass door from the mansion-house gave entrance into a suite of hot and green-house apartments of nearly 260 feet extent" (Lettsom, 1786, pp. 37-39).

Lettsom went on to describe the plants in the newly introduced species which thrived outdoors at Upton,

> "...in the open ground, with the returning summer, about 3,000 distinct species of plants and shrubs vied in verdure with the natives of Asia and Africa. It was in this spot that a perpetual spring was realized; where the elegant proprietor sometimes retired for a few hours to contemplate the vegetable productions of the four quarters of the globe enclosed within his domain : where the sphere seemed transposed, and the Arctic Circle joined to the Equator" (ibid., pp. 39-40).

Fothergill's well-stocked stove and greenhouse, interestingly accessed directly from the house, will be discussed in the next chapter, but notable here is the extent of the plants which made up the wider garden, and the inclusion of exotics within the landscape. The plants outside were not the usual trees and shrubs, but were part of his plant collection. They clearly originated

from many parts of the world, and those which would survive outside were grown there with success. The record of a canal and lines of sight through the shrubs suggests that Fothergill's diverse range of plants was planted to an intentional design, providing a spectacle for the viewer in addition to their individual interest.

Contemporary, but with a much larger estate of 736 acres was Margaret Cavendish Bentinck, The Duchess of Portland (1715-85), who kept one of the most impressive plant collections of the eighteenth century. Unfortunately, there remains tantalisingly little evidence for the landscape and its structure. The duchess remodelled the grounds of Bulstrode Hall in the late 1750s, moving away from formal gardens and creating more naturalistic vistas. A long, straight canal was permitted to remain, but the kitchen garden was removed to the periphery of the garden and a parterre and shrubberies added, along with woodland walks and expanses of grass (Laird, 2015, pp. 281-282). She removed an avenue leading to the house, and replaced a formal lawn in front of the house with a horseshoe gravel walk. Into the grounds she incorporated a dairy, aviaries, a grotto, a menagerie and a botanical garden (Stott, 2013, p. 36). The aviary housed exotic birds, and in the menagerie were buffalo, Indian bulls, zubu cattle and Java hares (ibid., p. 7)

Such a grand landscape must have been an impressive spectacle, but unfortunately little information is available on the specifics of its development. The house and garden were remodelled in the nineteenth century and no traces remain of the eighteenth-century garden features (ibid., p. 46). Some information is available from contemporary sources, including from Humphry Repton's *Observations on the Theory and Practice of Landscape Gardening*. Of Bulstrode he notes,

> "...the pleasure ground is perfect as a whole, while its several parts may furnish models of the following different characters of taste in gardening: the ancient garden, the American garden, the modern terrace walks, and the flower garden: the latter is, perhaps, one of the most varied and extensive of its kind, and therefore too large to be otherwise artificial, than in the choice of its flowers and the embellishments of art in its ornaments (Repton, 1805, p. 100).

The plan of Bulstrode provided by Repton shows the position of the features that survived following the duchess's death, including the American Garden, the Flower Garden and a Nursery for Flowers (figure 5). Notably, all of them were positioned right next to the house, giving the duchess easy access to the collections, while the kitchen garden was located a distance away to the south, as was the usual custom of the period. The groves, fishponds and the park existed alongside the botanic garden and menagerie (Laird, 2015, p. 281). The duchess had all her diversions at her fingertips, and further chapters will discuss how they were utilised.

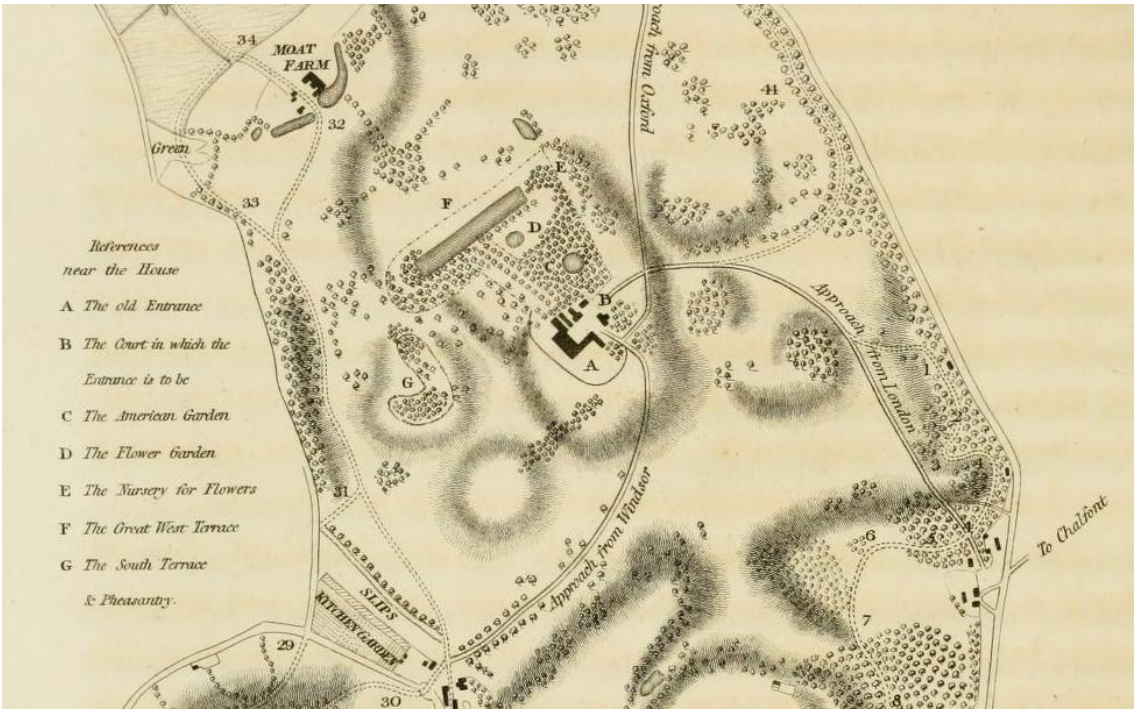


FIGURE 5: A MAP SHOWING THE EXISTING FEATURES OF BULSTRODE HALL FROM HUMPHRY REPTON'S 'OBSERVATIONS' (REPTON, 1805, P. 66)

Despite a passion for botany and his part in the creation of the new botanical garden at Kew, John Stuart, third Earl of Bute also enjoyed a fashionable landscape. In the late 1760s he began work on his new residence at Luton Hoo in Bedfordshire, commissioning Lancelot Brown to begin work on the grounds a full two years before work started on the house (Coats, 1975, p. 38). Brown dammed the river Lea to make a lake a quarter of a mile wide in front of the house, but was also clearly tasked with maintaining provision for Stuart's botanical interests (Livsey, 2014, p. 35). The work at Luton Hoo took Brown over ten years and cost Stuart over £10,000 (ibid., p. 35). During the remodelling of the garden, Brown made sure to create space for the cultivation of plants and other rarities. Bute's cousin, Lady Mary Coke wrote in June 1779,

> "This Place is in greater beauty than I ever saw it the water now finish'd & is magnificance & the quantity of the flowers is amazing, you know, I believe there is thirty acres of ground laid out in walks with a boarder for flowers of twelve feet on each side which is now in its high beauty as the flowers now blooming are almost all of them sweet & they perfume the air. There is a flower Garden besides which is for those of a superior kind, in short there is nothing like it… which you will easily believe when you consider that Ld Bute understands all these things beyond any other Person & that he spares no expense" (from Livsey, 2014, p. 37).

This account documents an extremely large area for planted shrubberies and a specified area for the earl's more rare and notable specimens. The thirty acres may not be exaggerated, in 1783 the *General Evening Post* reported that,

> "Of ground at Luton Hoo, there are, in all, about 1400 acres; of which, deducting 100 acres farm, 70 of ornamented ground, and four acres each for the botanical and kitchen garden, the remainder is the park" (*General Evening Post* 1783, p. 65)

A four-acre botanical garden would have provided ample space for the Stuart to experiment with and cultivate his prized specimens.

The house at Luton Hoo was undoubtedly a spectacle, but while botanising in the New Forest one day the earl happened upon a beautiful spot near Christchurch in Dorset (then Hampshire) and resolved to build a second home at Highcliffe. Initially this was planned as a smaller residence, but was gradually enlarged to include a laboratory, two libraries, a forty-foot saloon, thirty bedrooms and further apartments (Coats, 1975, p. 41). Stuart converted an exposed area of heathland into a site which would be advantageous for his plant collections, planting shelter belts, reinforcing cliffs to avoid landslip, a lawned area and space for his specimens (Livsey, 2014, p. 46). There is little evidence for the layout of the features or plantings at Highcliffe but contemporary visitor sources speak of it being like another Kew on a smaller scale containing costly exotics and herbaceous plants, and a hot house 250 feet long (ibid.). The post-mortem sale of Stuart's possessions included a three-day plant sale and referred to two long conservatories, a little greenhouse, a little conservatory, a flower garden, an American garden, a kitchen garden and a raspberry quarter (ibid., pp. 46-47). Unfortunately, nothing remains of this earl's second home at Highcliffe, the encroachments of the sea necessitating its demolition after his and Lady Bute's death (Coats, 1975, p. 45). We therefore know very little about the grounds, as the earl was by this point withdrawing from public life, but the available information on the plant collections will be discussed in the next chapter.

Perhaps the highest profile collection of exotics within the landscape belonged to Charles Hamilton (1704-1786) at Painshill Park in Cobham, Surrey where he lived until 1773. No estate papers exist for the garden (Hodges, 1973, p. 39), but it is known that the land was leased to Hamilton in 1738 (ibid.) when he set about creating a garden in the landscape style. Hamilton was the youngest son of the sixth Earl of Abercorn, was part of the Prince of Wales' staff as Comptroller of the Green Cloth, and MP for Truro (ibid., p. 40). He travelled in the 1720s and 30s (ibid., p. 39), gaining architectural ideas which would inform the follies on his estate which he used to great effect. Hamilton is viewed as a pioneer of planting in the landscape, with a particular tendency towards species from North America (Symes, 1983, p. 112).

Hamilton experimented widely with planting within the landscape at Painshill, particularly with recently introduced North American species (Symes, 1983, p. 112). Much of the exotic planting was spread around the wider landscape as part of the landscape garden and shrubbery, but Hamilton also had an area for rare flowers and shrubs known as the "Orange Garden" (Laird, 1999, p. 12). The garden was managed by a principal gardener, Peter Thoburn, who Symes notes was known for his nursery at Brompton, along with seven under gardeners (Symes, 1983, p. 113).When Linnaeus visited the site in 1781 with Joseph Banks and Daniel Solander, he declared that there was a greater variety of firs on the site than he had seen in any other part of the world (ibid., p. 112). Hamilton was a subscriber to Peter Collinson's seed distribution scheme and exchanged plant material with Abbé Nolin, a director of the French Royal nurseries who also established a nursery specialising in exotics in Paris (ibid.). In letters to Nolin, Hamilton noted cultivation requirements of various plants in the landscape, including *Catalpa* and myrtle favouring a humid soil, and Portuguese laurel surviving heavy frosts without covering. The excesses of the park finally took their toll on Hamilton who ran out of money and sold the estate in 1773, but it is a fine example of investment in a landscape with an integrated plant collection, and another instance of a botanical garden being encompassed within a landscape setting.

THE BURTON CONSTABLE LANDSCAPE

DEVELOPMENT OF THE HOUSE AND GARDEN

William Constable invested heavily in his house and garden, the various stages of remodelling were dependent on his passions and later, his physical abilities. Little is known of his life between the death of his father in 1747 and his activity at the hall in the late 1750s, so much so that Elizabeth Hall counts these years as 'a mystery' (Hall, 1986, p. 6). Sources do suggest, however, that he took an active interest in the hall and garden from the beginning of his ownership. Vouchers held at East Riding Records office confirm that in 1751 he purchased fruit trees including peaches and a nectarine (ERRO DDCC/153/46), in 1752 he purchased further seeds and trees including four more peaches and nectarines (ERRO DDCC/153/49/1-8), and in 1757 he purchased seeds for the kitchen garden, cucumber seeds, a vine and yet another peach tree (ERRO DDCC/153/50/8). It is unclear whether this indicates that a hot house was available at this time, or whether the repeated purchase of tender peach trees represents an attempt, and failure, at growing the plants outside, against a heated wall.

Despite these occasional purchases, the grounds were not well tended. In a letter to his half-brother, Marmaduke Tunstall, dated 1784, Constable described them in the 1740s:

> "My park 40 years ago was 400 or 500 acres a Wilderness of Old Thorns, old decayed forest trees, whins or gorse higher than a man on horseback, rushes, hillocks, deep

ridge and furrow, rivers and swamps and full of all kinds of game. Now all are removed and at great expense" (Constable, cited in Turnbull, 1998, p. 10).

FIGURE 6: PLAN OF BURTON CONSTABLE FROM 1755, SHOWING A FORMAL GARDEN LAYOUT AROUND THE HOUSE AND AVENUES RADIATING TO THE WEST AND SOUTH. (BURTON CONSTABLE HALL, AUTHOR)

When William moved into Burton Constable Hall, the grounds were evidently overgrown, although the design was a formal one including avenues, lawns and a formal courtyard to the front of the house (Turnbull, 1998). The main phase of reconstruction of the grounds began in the later 1750s, and in 1758 he wrote to his step-mother, Elizabeth Constable, that he was extensively remodelling his house and park (ERRO DDCC/144/9). His efforts at Burton Constable involved some of the most esteemed architects, designers and craftsmen of the day, including James Wyatt (1746-1813), Thomas Chippendale (1718-79) and Lancelot Capability

Brown (1718-83) (Connell, 2014). From 1757 Constable built a menagerie for animals and a large stove for tender plants (Turnbull, 1998, p. 11), as well as increasing the landscaping and cultivated area of the grounds, and employing three new gardeners. Both structures highlight Constable's interest in the natural world and his desire to keep it at close quarters for study, and will be discussed further in the next chapter.

The landscape around the house displays two distinct phases of development. Each phase betrays a distinct character which is in turn informative about Constable's shifting priorities. The early phase runs from Constable's first occupation of the house in the 1750s to his Grand Tour in the late 1760s, and the later phase runs from his return from Europe in the early 1770s to his death in 1791. His focus and influences clearly change during over these two periods and provide useful insights into the relationship of a gentleman with his collections and his landscape.

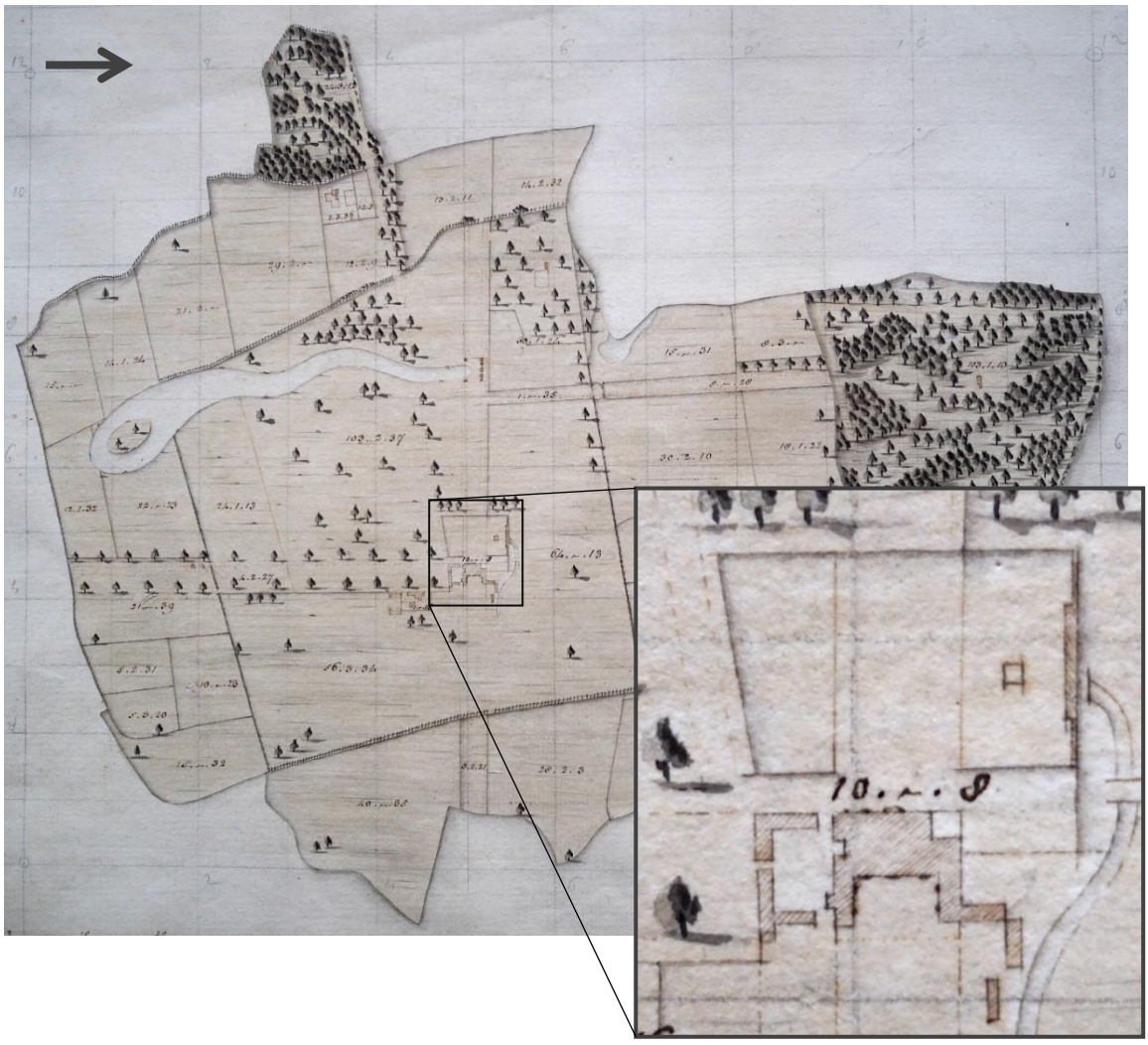


FIGURE 7: PLAN C. 1767 SHOWING BURTON CONSTABLE. THE ENCLOSURE TO THE WEST OF THE HOUSE HAS BEEN EXTENDED TO THE NORTH AND SHOWS A THICKENED WALL ON THIS SIDE. IT IS PROBABLE THAT THIS IS TIMOTHY LIGHTOLER'S STOVE (FIGURE 9), WHICH IN THIS POSITION WOULD BE FACING SOUTH (BURTON CONSTABLE HALL, AUTHOR)

A number of plans of the house and park survive from the early phase of development, displaying varying degrees of ambition and potential expense for Constable, however it is unclear which of the plans were implemented and which were aspirational or rejected proposals. Hall (1995, p. 146) suggests that the number of extant plans show Constable to be indecisive, employing the services of a number of designers to assist in the remodelling. Plans exist by Thomas White (1736-1811), local architect Timothy Lightoler (dates uncertain) and Lancelot Brown. Turnbull (1998, p. 13) suggests that one undated, anonymous plan of the park in an unrefined hand may even be by Constable's gardener, Thomas Kyle. One early plan from 1755 (figure 6) shows a garden with a particularly formal framework (Hall, 1995, p. 146), maintaining the geometric style from earlier periods.

A plan understood to be from around 1767 (figure 7) shows the development of the grounds around this time, including that the enclosure to the immediate west of the house visible on the 1755 plan, had been extended to the north over the moat, and that a feature on the north wall was indicated on both plans by a dark line, thickened in the centre. This is almost certainly Constable's first stove, built in 1758 to house his collection of tender plants. The profile of the enclosure and the shape of the thickened wall fits the more detailed rendering of a plan showing the stove garden only (figure 8). The stove, and stove garden, in which Constable would have housed his specimen plant collection, extends over an area of 2.8 acres.

FIGURE 8: THE OUTLINE OF CONSTABLE'S STOVE GARDEN BY TIMOTHY LIGHTOLER, UNDATED, THOUGHT TO DATE FROM THE MID 1760S. THE PROFILE OF THE STOVE ON THE NORTH WALL FITS THAT OF THE DARKER SECTION ON THE 1767 PLAN (FIGURE 7) (BURTON CONSTABLE HALL, AUTHOR)

The original stove complex was designed by the local architect Timothy Lightoler, who had originally been commissioned to start work planning both the hall and gardens in 1757. Lightoler's plan for an impressive range of stoves (figure 9) has previously been dated to 1770, although it is suggested here that the date is earlier, 1757 or 1758, based on a quote by Thomas Knowlton (1691 – 1781) in a letter dated 1758. Knowlton had been gardener to James Sherard at Eltham and the Earl of Burlington at Londesborough. Blanche Henrey's (1986) biography of the gardener shows that he was celebrated for his skill and knowledge of building works and plant growth, and his council was sought extensively by those aiming to cultivate exotics. Constable commissioned Knowlton to oversee the building work of the stove. In 1758 Knowlton wrote to his correspondent, Richard Richardson, the botanist of North Bierley that:

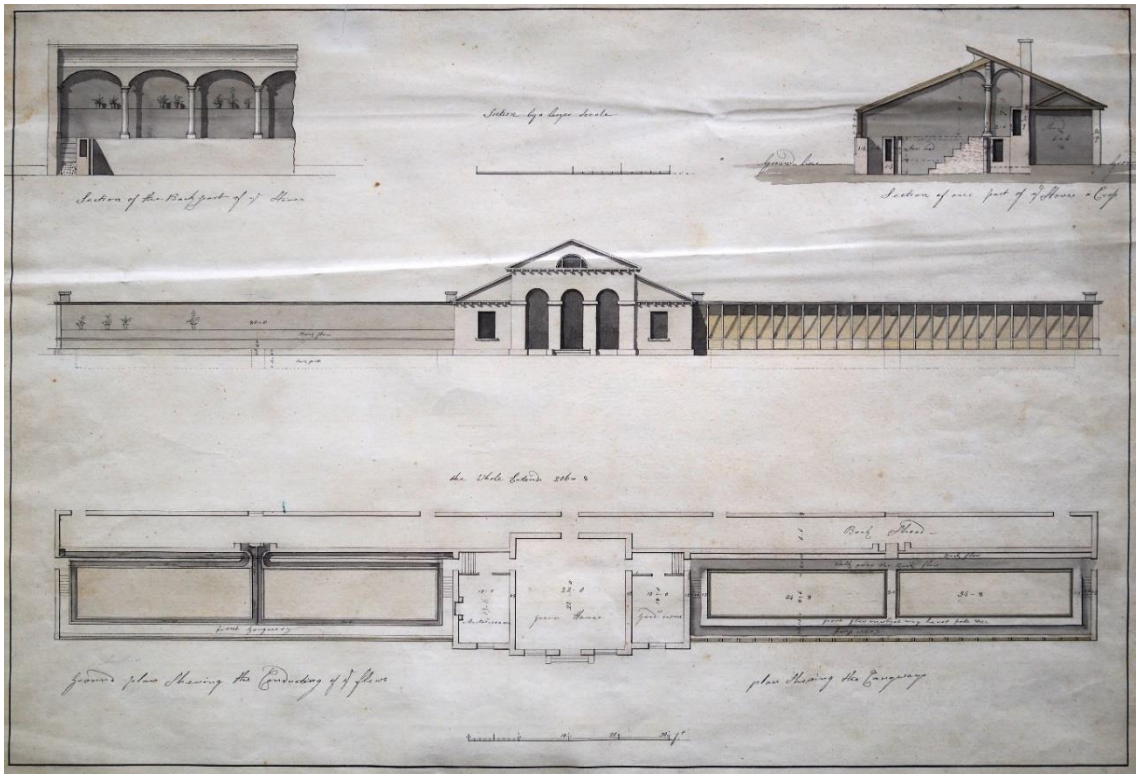
> "I have Latly just finished 2 stoves with a Little Green house in y^{e} middle of y^{m} 206 feet Longe for w^{m} constable Esq^{r} at Burton near Hull with fire walls 170 Long at y^{e} each end of y^{m}, all now I say compleat & finished about 6 week since & is y^{e} greatest in it[s] kind of any I know" (in Henrey, 1986, p. 249)

Knowlton's dimensions match with those on Lightoler's plan (figure 9), suggesting that this was the range of stoves built at Burton Constable in the late 1750s. It is clear that Constable had seen this stove development as a priority in the development of his estate, the menagerie for his animal collection following shortly afterwards. It was a large and impressive complex, and although the largest that Knowlton had heard of, it was soon outdone in scale by the hot houses of John Stuart, Third Earl of Bute, and even the physician John Fothergill. The Burton Constable stove contents and the dedicated plant collections within the garden are significant, and will be discussed in detail in the next chapter.

The stove garden and new stove range persisted for a decade, but by the mid-eighteenth century, the trend towards an open, landscape style in garden design was becoming ever more popular. In this earlier phase of his occupation of the hall, Constable defied its conventions, evidenced by the plans above. Whilst it was not unusual for a garden of this time to retain formal features, as at Wroxton Abbey (Edwards, 1986), prominent estates such as Rousham, Stowe and Chiswick House adopted a more naturalistic landscape style from the 1740s. Almost two decades later at Burton Constable, the stove and walled garden around it were built immediately adjacent to the west front of the house. It is unclear how much input Constable had into the design, but it is probable that he had specified the locations in order to facilitate access to his plant collections. Certainly, the smells and soot from the tan beds[4] and firewalls cannot have been ideal immediately outside the grand staircase, long gallery and bedrooms. It

[4] Tan beds included a mixture of horse manure and tanner's bark which created warmth for the plants whilst the mixture decomposed.

is possible that these inconveniences contributed to the second phase of development of the grounds.



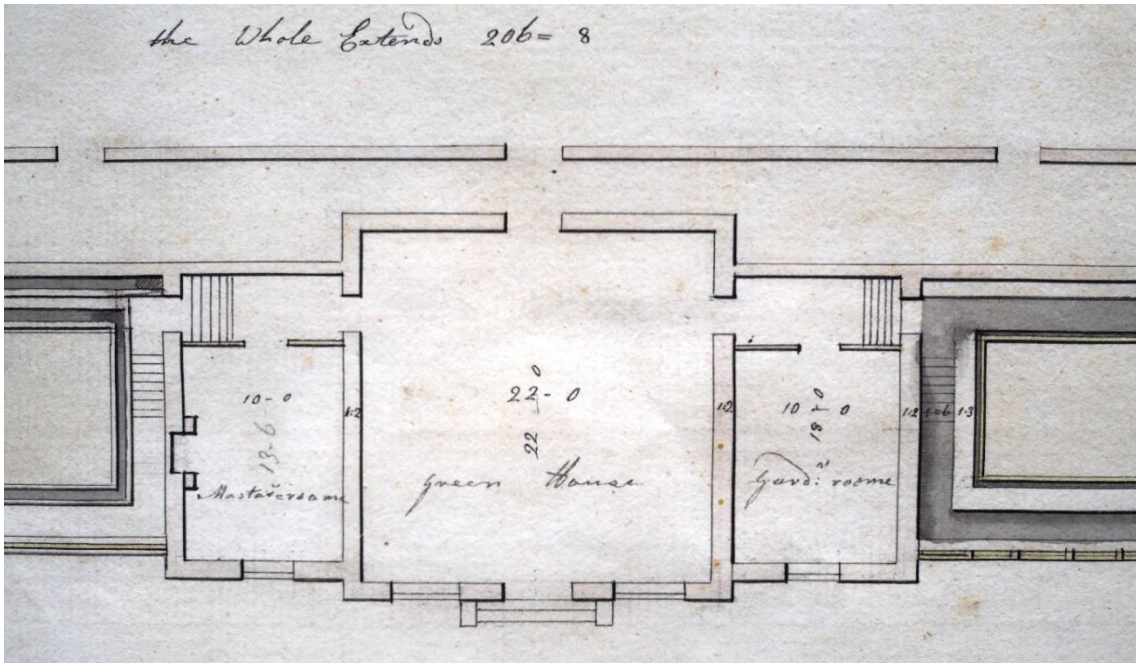


FIGURE 9: PLAN AND DETAIL OF TIMOTHY LIGHTOLER'S PLAN FOR THE BURTON CONSTABLE STOVES, SUGGESTED TO DATE TO 1757 OR 1758. THE DIMENSIONS VISIBLE (206 FEET LONG) AND THE DETAIL CORRESPOND TO KNOWLTON'S ACCOUNT FROM 1758

FIGURE 10: THOMAS WHITE'S PLANS FOR BURTON CONSTABLE DATED 1768. THE PLANS SHOW THE REMOVAL OF THE ENCLOSURE TO THE IMMEDIATE WEST OF THE HOUSE, WITH A NEW WALLED GARDEN SITED ABOUT A QUARTER OF A MILE AWAY FROM THE HOUSE TO THE WEST (BURTON CONSTABLE HALL).

Within a decade of the original 1750s improvements, Constable had resolved to remodel the grounds once again and the parkland entered its second significant stage of development; plans from the late 1760s show elements of the popular landscape style being introduced. The extant plans include an opening out of the landscape and removal of hedges, developments to the sinuous lake and the planting of clumps of trees. The landscape designer Thomas White produced an extensive new plan for Burton Constable in 1768 (figure 10), which proposed to transform most of the grounds into parkland (Turnbull, 1998, p. 14). In the same year, Timothy Lightoler submitted an account for designs for a new kitchen garden and stoves, as well as new stables in the grounds (ibid., p. 13). Constable embarked on a three-year grand tour from 1769 to 1771, it is uncertain whether he initiated the plans on his return, or if the plans were executed while he was away. Either way, in the early 1770s he would have experienced a transformed parkland, the opening out of the west front of the house, a new walled garden and stove complex about a quarter of a mile to the west of the hall, and his new stables. A stove plan by Constable's Steward John Raines which matches the surviving structures on the site is dated

1771 (figure 11). It is possible that this was completed on his return, or that Raines drew the new structure which was designed and charged for by Lightoler in 1768 after its completion.

The new stove was smaller, and more utilitarian than the original near the house. Parts of the complex survive today, two small greenhouses, the sunken base of the back shed of the stove and two firewalls being recognisable (figure 12). Unlike Lightoler's first stove complex on the site, there is only one stove range, the whole structure extending to approximately 130 feet, compared to the 206 feet of the range of the original. The stove was constructed with flues, a walkway and deep growing beds with a shed at the back for hearths and storage. The layout of the growing area itself was similar to the original stove, with the addition of a second growing bed between the walkway and the front of the structure. The two, three-bay greenhouses which flank the heated glasshouse have different purposes, one is a dwelling, presumably for the gardener, and one is a greenhouse with back storage.

The original stove complex would have probably remained until the construction was complete, as the tender plants would not have survived an East Yorkshire winter outdoors, presuming that they were retained. The construction of the new walled garden which is referred to by Brown in his later directions as the New Gardens (Hall, 1995, p. 154) is particularly significant. The original walled garden and extensive, expensive stove complex, constructed only a decade earlier, had been completely razed to allow sweeping views from the house and had been relocated a significant distance away as part of White's 1768 plan. This marks a significant shift in the ethos of the space. The move follows a wider trend of relocating walled gardens in the mid- to late-eighteenth century, as identified by Williamson (1995, p. 92). Constable had clearly prized his plants and stove and they would have been less accessible from the house for him or for visitors. The move seems to reflect a loss of botanical focus within the garden from this time. The pressed plant collections to be discussed below were created from the 1740s to 1760s, with botanical activity within Constable's collections and correspondence significantly reducing after the redevelopment.

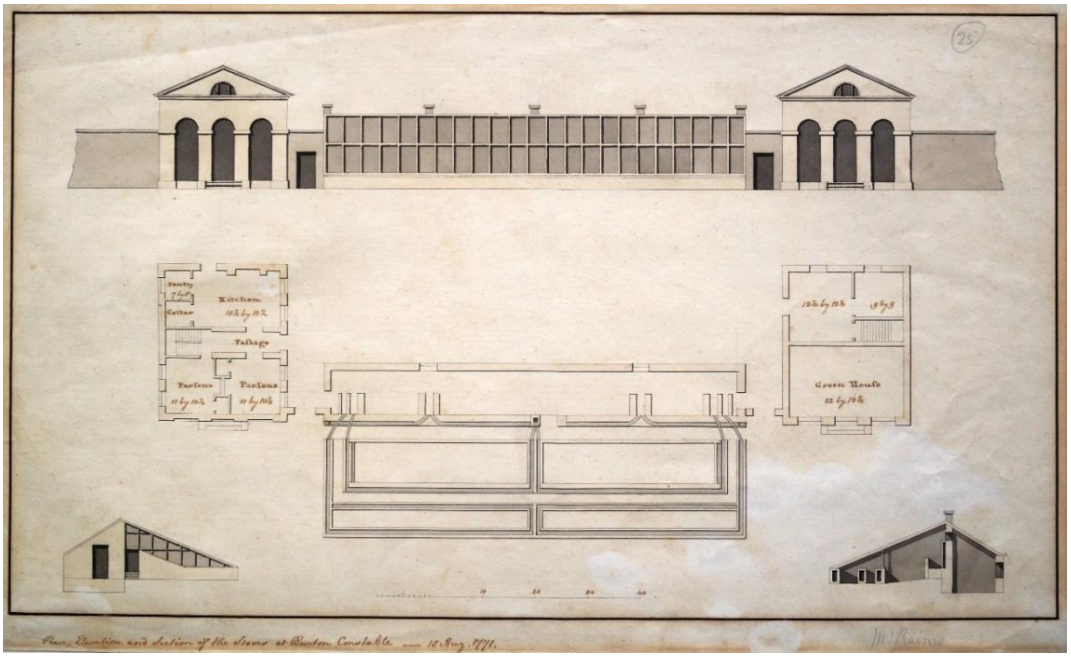


FIGURE 11: 1771 PLAN OF THE STOVE FOUND AT BURTON CONSTABLE BY MR RAINES. THE PLANS ALMOST EXACTLY MATCH THE STOVE STRUCTURE WHICH SURVIVES TODAY (AUTHOR).

FIGURE 12: THE SURVIVING ELEMENTS OF THE STOVE COMPLEX, NOW CONVERTED TO A FORMAL GARDEN AND LODGING. THE TWO SMALL GREENHOUSES ARE CLEARLY PRESENT, WITH THE AREA WHICH WOULD HAVE HOUSED THE STOVE IN BETWEEN (AUTHOR).

Lancelot 'Capability' Brown had been involved with the development of Burton Constable for a number of years, beginning in 1757 when Constable consulted with him about a rococo ceiling design for the great hall (Turnbull, 1998, p. 11). A design from around 1772 shows clumps of trees framing views from the house, and Lightoler's stables which had recently been completed (figure 13). The consultation of both White and Brown may not be coincidental. White had been employed by Brown from 1759 to 1765, following which it has been suggested by Finch (Unpublished) that Brown promoted the designer to his clients the Lascelles at Harewood House, West Yorkshire, to manage the improvement of the site until his return in the early 1770s. It is possible that the same occurred at Burton Constable, where Brown was retained in a consultative capacity following the 1772 plan, and continued to produce directions for the hall and landscape.

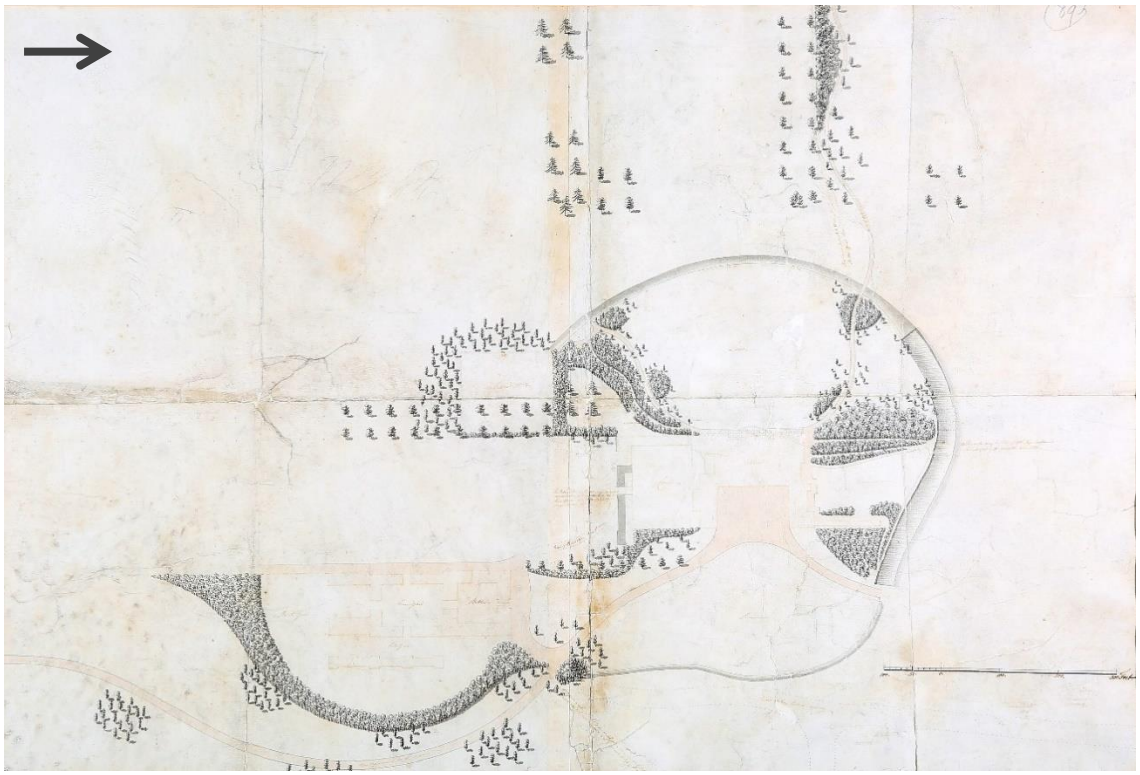


FIGURE 13: A PLAN BY BROWN, C. 1772, SHOWING LIGHTOLER'S STABLES WHICH WERE COMPLETED IN 1771. (BURTON CONSTABLE HALL)

From 1772 to 1782 Brown made repeated visits to Burton Constable to consult on improvements to the grounds. These directions were dutifully recorded by Constable's steward, John Raines and provide a useful chronological summary of the suggested activities in the garden from this period. Brown advised on aspects such as the planting of tree clumps, the creation of a lake from the fish ponds, the building of a bridge and the contouring of the landscape. His influence did not, however, completely remodel the landscape as it did at other similar sites.

The developments to the garden, though based on fragmentary evidence, enable the ethos of the garden and Constable's approach to plants, gardens and landscape to be charted over time, the relocation of the walled garden in the late 1760s being particularly significant. The change of mindset is further evidenced in Constable's garden staffing arrangements. During the 1760s he employed two regular gardeners, Thomas Kyle and Robert Peacock. Kyle was instrumental in developing Constable's collections of exotics and was particularly passionate about horticulture himself. Very little is known about Kyle, although it seems likely that he was the same Thomas Kyle who published 'A Treatise on the Management of Peach and Nectarine Trees' in 1783 (Kyle, 1783). Having a passionate gardener who was also literate must have been a great advantage for Constable and his collections. Indeed, most records of the purchase and collection of exotic plants in the living and dried collections date to the ten years during which Kyle worked at Burton Constable. For the more general running of the gardens Constable had a gardener called Robert Peacock, who appears less frequently in the archive material. According to account books, Kyle left his employment at Burton Constable in the late 1760s (ERRO DDCC/140/2), although the reason for his move is not apparent. This, along with the waning botanical interest, appears to represent a general lessening of scholarly purpose for the garden, and more emphasis on landscape and style.

Constable's grand tour with his sister Winifred was motivated partly out of interest and partly for his health. He had suffered from various complaints including gout for a number of years and part of the reason for the trip was to commence a programme of treatment (Connell, 1998). His sister Winifred dutifully kept a record of his condition from 1768 to 1774, in both vivid and monotonous detail (ERRO DDCC/150/274). The trip introduced William to new culture and society, and he purchased an extensive range of furniture and artwork for Burton Constable Hall. This new experience and widening of interests, in addition to William's ailing heath, seems to have contributed to his less active participation in his garden.

The shift of focus, though seemingly a distinct break, was not absolute. Most evidence for the garden in the 1770s comes from Brown's directions, and were not focussed on individual plants. Brown makes virtually no mention of shrubs or flowering plants (Turnbull, 1998, p. 18), only that those in Miss Constable's garden should be low so that the wood may be seen over it (Hall, 1995, p. 155). Nevertheless, the cultivation of plants is still apparent on the site, the large walled garden and smaller, but still impressive stove complex showing significant investment. Constable desired to continue to grow rare or exotic plants, or at least to provide the illusion of or opportunity for his doing so. His ailing health would have made it increasingly difficult to make the quarter mile journey to the site, and it is unclear who was tending the plants at this time. Significantly less evidence and correspondence exists relating to plants from this and later periods. While most of Brown's directions were landscape based, the stoves were mentioned in one entry from 1782, which stated,

> "Stoves – The fault lies in the management not in the Stoves. – Take away part of the Vines which shade the sun from the Pines – To raise the Stoves will not answer, it will tear the Glass frames to pieces. – Tho' the front flue does not act it is of no consequence" (Hall, 1995, p. 160).

This does indicate that the second stove was still active a decade after it was built, although apparently not well-managed and was used at least in part as a vine house, rather than a stove for specimen exotics.

In the late 1770s Constable went on to build a 'dry house' near to the main house, which became a decorative orangery (Turnbull, 1998, p. 23) which remains today. The dry house is only known from one plan of 1779 and has been supposed by Hall (1992) to have been used for the cultivation of plants in a warm setting provided by firewalls, but without the addition of humidity from a water heating system. It is known from Brown's directions quoted above that the stove was still in existence in 1782, well after the dry house appears on the 1779 plan, but that it had fallen into disrepair. Given Constable's ailing health by this time and the fact that the dry house was later converted into a decorative orangery, it is likely that the function of the building was to make some plants available for viewing for the invalided Constable. The lawn would have been far more accessible to a gentleman with declining mobility than the stove a quarter of a mile away. Whilst not as ideal for growing as the moist stove environment, tender plants may have been cultivated or displayed in the structure, as they would be in an orangery. These structural developments suggest that while Constable was no longer engaging in scholarly study and plant technology in his later years, he still valued the presence of the curious and exotic in his garden and invested in being able to experience it.

PLANT COLLECTIONS IN THE LATER LANDSCAPE

Throughout the remodelling of the parkland in the mid-eighteenth century, it is clear that William Constable kept some provision for the growth of tender plants, although this was evidently greater in the decade from 1757 to 1768 before the stove complex was moved further from the house. In addition to the plants intensively cultivated, however, interesting and new plants were also incorporated into the wider landscape. The landscape of Burton Constable Hall is one which changed significantly at the hands of its owner. Even before the plant collections proper are discussed, Constable's eagerness to retain character in the planting of the landscape is evident through the whole of his occupation of the hall.

Planting trees was a cornerstone of the English gentleman's landscape ambitions, representing the order, stability and security of landed families (Williamson, 1995, p. 128). On a visit during September 1778, Brown had suggested that Constable "plant a screed of Wood 120 Feet broad from the large Clump on the N. side of the Lawn", as well as "a Clump in the Corner of the Far

Park Close" (Hall, 1995, p. 158), directions which were dutifully recorded by steward John Raines along with further directions from the visit.

A little over a year later, a bill from George Telford dated December 1779 recorded the purchase of a large number of trees and shrubs, including many which had overseas origins,

> 10 Virginian Flowering Ash
> 5 Entireleavd Ash
> 5 Carolina Ash[5] & 5 Manna Ash[6]
> 200 Spanish Chestnuts - 2 feet transplanted
> 400 Witch Elms - 2 feet transplanted
> 10 Cornish Elm
> 21 White American Spruce Fir – 2ft
> 100 Green Hollies Transplanted 9 & 10 inches
> 200 - Limes transplanted – 3 feet
> 28 Scarlet Oaks – 3&4 feet
> 8 Turkey Oaks
> 50 Occidental Platinus – 6 & 7 feet
> 40 Broad leav'd Spanish Platinus 6 & 7 feet
> 100 White Poplars – 3 & 4 feet
> 21 Balsam Poplars
> 100 Yews – 2 feet
> 10 Standard Almonds
> 28 Double flowering Dwarf Do
> 20 Common Barberries
> 50 Caledonian Laburnum
> 20 Pensylvanian Maple
> 168 Alders Transplanted
> (ERRO DDCC/153)

In total 1,599 trees were purchased in one transaction, at a final cost of £19.14.9, a sum which roughly equates to the average worker's salary for a whole year in 1779 (Clark, 2011). The list represents a significant amount of non-standard, large landscape trees at a time when Brown was extensively directing on the development of the parkland. This purchase clearly reflects Constable's continuing interest in the exotic, and perhaps represents his own interpretation of Brown's instruction to plant further trees. It is uncertain where the trees were planted or if they made up the plantings that Brown had indicated should be established in 1778. Nevertheless,

[5] *Fraxinus caroliniana*, native to Cuba although likely procured from America at this time
[6] *Fraxinus ornus*

in these numbers they could not fail to be a prominent feature in the landscape, whether in clumps or as specimen trees.

These more exotic choices were unlikely to comply directly with Brown's vision for the landscape, the designer preferred native deciduous trees such as oak, beech and elm. His next visit came the following year in 1780, and the corresponding directions make particular and repeated reference to planting with 'Forest Trees' (Hall, 1995, p. 159). This is a distinction that he had not made in the previous eight years of directions. This new qualifier was perhaps in reaction to seeing the eclectic collection of exotic trees which had been planted following an interpretation of his earlier and more open suggestions. In his directions of 1780 he specifically directed to "Fill up the Clumps with Forest Trees – too many Firs at present in those last planted. Add more Forest Trees to them" (ibid., p. 160). Twenty-one firs had been purchased in the large tree order from Telfords. Five years earlier, in 1775 Brown had specifically directed to, "Take away many of the Ash Trees out of the Clumps & plant better kinds in their room – such as Oak, Elm, Larch, Beech etc", (ibid., p. 157). He would presumably not have approved of the purchase of 25 trees of four different species of ash in Constable's most recent purchase.

This evidence supports the suggestion that Constable was increasing the breadth of his plant collections in the landscape for his own interest and pleasure while at the same time employing Brown to consult on the design of the landscape. Brown's directions were valued and followed, but not to the detriment of Constable's own interest and ideas, consistent with Williamson's emphasis of the agency of the owner (1995, p. 7). Using Brown as a consultant whilst maintaining some creative control of the landscape particularly through planting where Constable had a particular interest was not an unfamiliar concept at the time. At Wrest Park in Bedfordshire for example, the ladies of the Grey family kept a keen interest in the design of the landscape whilst using Brown to advise on practicalities.

STYLE VERSUS PLANT COLLECTIONS

During the eighteenth century, a vast quantity of new plants was being traded by nurseries and merchants. Many of them found homes in the gardens of the wealthy, and required space and often very particular care. These ephemeral elements are often overlooked, but delving deeper shows the lengths that many land owners of the time went to, to house and show off their new acquisitions. Brown and the wider landscape movement were undeniably dominant influences in eighteenth-century landscape development. However, the examples of plant collections featured and housed within the landscapes outlined in this chapter clearly show that the trend did not preclude other influences on the site. Burton Constable and Luton Hoo demonstrate how a member of the gentry could aspire to Brown's involvement and gather the prestige attached, whilst also maintaining their own interest within the grounds. Others chose to define

the layout themselves, but the examples do suggest that even within the gardens of those fanatical about plants, the landscape style was often reflected to a greater or lesser extent.

Prized plant specimens were often housed within specialist areas which may be known as a botanical gardens or flower gardens and tender plants within stoves or hot houses. The features fit broadly into Laird's (1999, p. 12) division of landscape park, pleasure ground and flower garden. All of the collections discussed above sat within a wider landscape structure, including the early example of the Duchess of Beaufort's Badminton, in its sprawling, geometric style. Most seem to have incorporated exotics into the landscape, some such as John Fothergill and Charles Hamilton to a great extent. This was making statements with plants on a grand scale. It is notable that Brown was involved in Burton Constable at all, he represented, however, a badge of quality and status. For William Constable whose learned interests had always been eclectic, and who aspired to fashionable taste, the use of Brown to his own ends allowed an acceptable compromise between fashion, curiosity and scholarship, particularly when his botanical interest waned.

Without the surviving bills of purchase and the now missing commonplace notebooks from Burton Constable, the estate information alone would not hint at the scale of plant collection on the site and the associated investment. Further research would usefully consider possible specialist garden areas within other estates of the period, and uncover potentially hidden botanical interests of the owners, adding further nuance to our understanding of the eighteenth-century pleasure ground.

CHAPTER 4: PLANT COLLECTIONS IN THE GARDEN

Having seen in the last chapter how the gardens of the gentry and professional class may be structured to accommodate new, rare and exotic plants, the focus now turns to the details of these plant collections. The extensive quantity and variety of plants produced by the thriving eighteenth-century nursery trade was destined for the gardens of the wealthy. Plants available in quantity were perfect additions to the shrubbery or to be planted in groups in the flower garden, whilst new and rare examples were eagerly purchased to be grown as more isolated specimens. It is these species, sought for their curiosity or scientific value which will be discussed in this chapter. Williamson (1995, p. 91) has identified specialised gardens within the wider pleasure ground and Laird (1999, p. 12) has expanded on the notion of the flower garden for curious or unusual plants. He identified that such gardens or areas were usually placed near the house, and that their layout was ordered as much for science as beauty. He has suggested that they were probably laid out much as a botanical garden, and probably looked something like a horticultural research station. The ephemerality of plants in the historical record and the generality of most garden designs mean that this is difficult to corroborate, and in reality the concept was probably very flexible, but Laird's suggestions do provide an excellent starting point to consider the outdoor botanical activities of some of the eighteenth-century gentry in more detail.

John Evelyn's *Elysium* (2001), originally published in 1700, contains extensive information on growing plants in flower gardens and hot houses, as well as a whole chapter devoted to 'Wonderfull and Stupendious Plants'. Chapter five will discuss in more detail how the wonderful (for the sake of spectacle) peaked in the seventeenth century and gave rise to scientific and botanically focussed collections in the eighteenth. The scientific world was expanding and becoming popular, and plants and botany were key players. Thomas Fairchild had successfully crossed *Dianthus caryophyllus* and *Dianthus barbatus* in 1717, producing what was commonly known as 'Fairchild's Mule' (Laird, 2015, p. 139), introducing the concept that new possibilities could be created by man, and opening up new economic, scientific and medicinal prospects. The gardens of the elite became arenas for collection, curation and prestige for rare specimens but also for more considered botanical collections. This chapter will consider these collections, the evidence for them and how we might reconsider them when studied alongside herbaria.

TRADE AND TECHNOLOGY

One of the greatest enablers of the rise of private specimen or botanical gardens was the availability of plants. During the early modern period the desire for plants by the wealthy fuelled the facility to supply them by merchants and nurserymen, and *vice versa*. By the eighteenth century, it was clear that the interest in exotic plants could offer a significant financial and social return; a thriving economy grew up around plants, seeds, roots, dried specimens and other related industries such as flower painting. The practice of transporting living entities, removed from their substrate and climate and brought on board a vessel surrounded by only salt-water for weeks at a time was difficult. Prior to the nineteenth-century invention of the Wardian Case[7], the most significant difficulty in transporting plants in the eighteenth century was the trouble of keeping them alive over long distances. In *Hortus Uptonensis* (c.1783), a catalogue of the plants in Dr. Fothergill's garden at Upton in Essex, John Coakley Lettsom articulated the difficulties with transporting plants over long distances,

> "the gardens of the curious have already been enriched with many valuable acquisitions from distant countries; but many attempts also to introduce several other plants equally rare, have been unsuccessfully made, owing to the bad state of the seeds or plants when first procured, or the method of disposing of them during long voyages; and such accidents as the utmost precaution cannot prevent" (Lettsom, c.1783, p. 4)

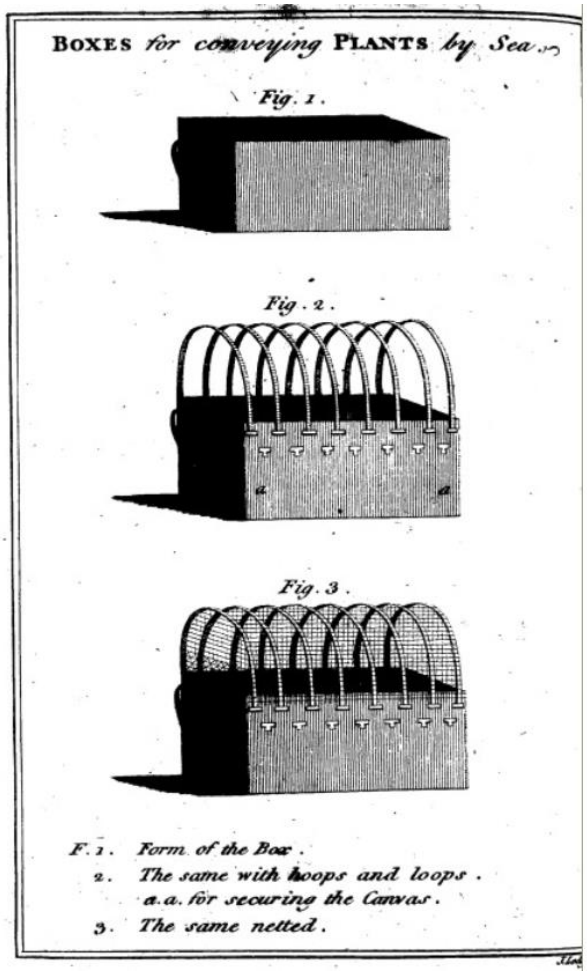


FIGURE 14: LETTSOM'S ENGRAVINGS OF BOXES IN WHICH TO TRANSPORT PLANTS BY SHIP (LETTSOM, C.1783, P. FRONT PLATE).

Lettsom went on to offer advice as to which seeds to choose before offering five methods of preservation; keeping in beeswax and washing in sublimate mercury; enclosing in paper or cotton and beeswax; packing in sand, paper and cotton, bottles and then covered in bladder or leather;

[7] a sealed case like a small greenhouse which retained substrate and moisture

preservation in canisters, boxes or jars with rice, bran or corn as packing and camphor, sulphur or tobacco as an insecticide; and also packing in damp moss to allow the seeds to germinate en-route (c.1783, pp. 4-6). He also provided guidance on the tools to take to enable collection (a mattock and a spade), how to lift the plants successfully, how to keep them in boxes for which he provided an illustration (figure 14) and the main and particular dangers which will face them on a sea voyage. Particular dangers included rodents and the effects of salt water settling on the leaves (ibid., pp. 7-9). Lettsom went so far as to suggest that,

> "...if it is convenient to the Captain to give up a small part of his cabin to the plants, this is certainly by far the best station for them; nor are they much in the way, as the place which suits them best is close to the stern windows: in this case they need not be furnished with their canvas covers; and they may frequently have air, by opening the windows when the weather is quite moderate" (ibid., p. 9).

The problems of physically transporting plants and seeds were not the only barriers to successful passage. Being high maintenance, plants were often the first to be discarded in an emergency. Conversely, in a time of conflict, they were also jealously guarded. Lettsom recorded,

> "...the true Cinnamon-Tree would have arrived here in health, had not the alarm of an enemy's ship induced my friend to throw it overboard, with other articles designed as a present : the war, however, may ultimately extend the cultivation of these exotics, which, like the inhabitants of a seraglio, are cautiously excluded from the eye of strangers" (Lettsom, 1786, p. 46)

These pre-Wardian Case difficulties meant that most plants which were successfully transported to England in the eighteenth century arrived in a dormant form, as seeds, bulbs, roots or rhizomes which were easier to package and could survive without water or light. Nevertheless, plants did arrive wholesale into the country, the rigours of collectors, merchants and those who transported them home testament to the desire of European consumers. An ever increasing and developing stock of publications was required for expertise in growing, and skilled gardeners were needed to tend them.

Relationships sprang up between different countries, such as that of the cloth merchant Peter Collinson and American botanist and explorer John Bartram. Collinson established a plant subscription service among affluent plant enthusiasts in Britain, and by 1740 Bartram was sending around twenty boxes of seeds and plants per year (Fisher, 2011, p. 17). Other popularisers and introducers of exotic flora included Francis Masson (1741 – 1805) for South African plants, Joseph Banks (1743 - 1820), for Australian plants and William Roxburgh (1751 –

1815) for Indian plants (Fisher, 2011, pp. 17-20). Banks had travelled to Australia on Captain Cook's Endeavour voyage of 1769-71, accompanied by botanist Daniel Solander and botanical artist Sydney Parkinson. Banks eventually took over directorship of the Royal Botanic Garden at Kew in 1772 at the suggestion of George III (Dixon, 2015, p. iv), his contacts and skills enabling more plants to come in to the gardens to be studied and successfully cultivated. Many of these plants eventually became more widely available to the larger horticultural audience through the expanding nursery trade.

As the trade in plants exotic and otherwise grew, the canal system offered more efficient means of transport around the country and the landed gentry had increasing time and money to spend on their gardens, the nursery trade boomed. A successful plant cultivation and selling enterprise required excellent growers, and so it is not surprising that many successful nursery owners were former gardeners to those of status. George London, of London and Wise and the Brompton Nursery had previously been employed by Bishop Compton at Fulham Palace, as well as by William and Mary, and James Gordon who owned the Mile End nursery was a former gardener to Lord Petre at Thorndon (Fisher, 2011, p. 15). Christopher Gray had salvaged many plants from Fulham Palace on the botanist and plant collector Bishop Compton's death in 1713, and became a leading supplier of American plants throughout the middle portion of the eighteenth century (ibid.). Joachim Conrad Loddiges, who eventually owned a successful orchid specialist business in Hackney, had begun his career in Britain as gardener to Dr Silvester, who belonged to a family noted for its scientific interests (Solman, 1995, p. 22).

Clark (2012, p. 31) has emphasised the role of the nursery man in the horticultural transformations of the eighteenth century due to their ability to supply vast numbers of plants for landscape transformations and rare exotics for specialised gardens. The reach and eventual impact of this increasing trade was extensive. The prolific shrub *Rhododendron ponticum*, which was eventually to become so widespread in Britain as to be classed as invasive, was introduced in the late-eighteenth century by Joachim Conrad Loddiges (Solman, 1995, p. 24). Loddiges' nursery is an excellent example of the boom in the plant trade in the eighteenth and nineteenth centuries. The nursery was established in 1771, and by 1817 had grown to such an extent that it housed the famously large Grand Palm House, pre-dating the one at Kew by 24 years (ibid., p. 35). An account of the glasshouse was presented by Dr Schultes, a Bohemian professor who visited the site in 1824. His account is recorded in Hooker's botanical miscellany of 1830 (Hooker, 1830).

> "...we will venture to say, that much as we have travelled and seen, we have met with no stoves, belonging to prince, king, or emperor, which can compare with those of Messrs. Loddiges, at Hackney, for the magnificence, convenience and elegance of their plan, and the value of their contents. Let my reader imagine a dome, eighty feet long

> and forty feet high, built in the form of a paraboloid, purely of glass, kept together by a delicate but strong frame of small iron ribs. This dome is heated by steam, when the rays of the sun are found insufficient to warm it. In ascending to the upper part of it by an elegant stage thirty feet high, we thence enjoy a scene entirely novel to a native of Europe: the tropical plants of both hemispheres, the eastern and the western, are stretched below at our feet; and the prospect is similar to what might be presented on a hill clothed with tropical verdure, through an opening in which we might look at the scenery beyond. A slight touch with one finger suffices to bring down from the light roof of this dome a fine shower of rain, which sprinkles all the exotic vegetation among which you walk." Dr Schultes in (Hooker, 1830, p. 75)

Schultes painted a picture of a magnificent edifice. For a nursery to have grown to such an extent as to afford such structures in under 50 years without noble patronage was remarkable. The nursery trade was booming.

Through merchants, the nursery trade or subscription services, plants made their way into the gardens of the wealthy. As any gardener is aware, being presented with the dormant form of an unfamiliar species is problematic, especially when it is rare and exotic, and so a marketplace for the sharing of cultivation techniques emerged. Developments in the printing business meant that information could be shared more easily, and the diversification of the market meant that it was increasingly shared in English.

Popular gardening books began to be produced in the mid-sixteenth century, the first of which being Thomas Hill's *A Most Briefe and Pleasante Treatise* in 1558. Following a steady stream of texts, Laird (2015, p. 133) has identified a flurry of publications in the first-half of the eighteenth century, which heightened excitement about exotic plants and botanical knowledge including John Martyn's *Historia plantarum rariorum* published in sections from 1728 to 1737, Mark Catesby's *Natural History of Carolina, Florida and the Bahama Islands* in 1729, then the *Catalogus plantarum* from the Society of Gardeners' in 1730. The acclimatisation of plants to a British climate was the main concern during this period (Laird, 2015, p. 133). The hardiness of new introductions was unknown, and many exotics were lost in the cold spells of the early eighteenth century, when many others such as the *Catalpa* proved their hardiness (ibid., p. 157).

One of the most influential and enduring publications was Philip Miller's *Gardener's Dictionary,* which was published in eight popular editions from 1731 to 1768. Focussing mainly on growing in England, the work was a reference book for those involved in horticulture, and included scientifically-based information on achieving the correct growing conditions, in addition to outlining the cultivation requirements of a vast array of plants (Elliott, 2011). During the period spanning the updates and various revisions of Miller's *Dictionary* came arguably the greatest

event in taxonomic history. Carl Linnaeus published *Systema Naturae* in 1735 and *Species Plantarum* in 1753, setting out a classification system based on the sexual characteristics of plants and a binomial naming system which would come to be adopted worldwide. The application of this system to the scientific world and its impact on collecting is significant and will be further discussed in chapter five.

TECHNOLOGY

Developments in technology during the eighteenth century enabled the successful cultivation of many plants which had not previously flourished in Britain. The story of the continuing development of modified growing environments over the seventeenth and eighteenth centuries tells of the endeavour and investment in the strive for horticultural success. Woudstra (2014) and Laird (2014) have provided an overview of the hot house technologies available to and used by growers in the seventeenth and eighteenth centuries which will not be repeated here, however, an overview of structure types will facilitate the discussion of different styles of growing.

Although the terms are often used interchangeably, stoves and greenhouses were very different structures in the eighteenth century. A stove was usually constructed with a roof of sloping glass and was kept warm all year round to assist the cultivation of plants and crops requiring constant warm temperatures. A greenhouse was heated only when necessary to keep off the threat of frost (Solman, 1995, p. 34) and usually had a flat and solid roof (figure 15). The two concepts were discussed by Philip Miller (1752) in his *Gardener's Dictionary*, published in various editions in the mid-eighteenth century. Miller identified two distinct types of stoves, a dry stove heated by flues in the walls which transmitted heat from fires, and bark stoves, which were heated by beds of tanner's bark which gave off heat as they decomposed (ibid., n.p.). Bark stove environments allowed plants which enjoyed hot and humid conditions to thrive, including pineapples (Laird, 2014, p. 59). The flue system led to a dry and often dirty or polluted environment which hampered the growth of some plants, but was more suited to growing xerophytic plants like *Aloe* and *Euphorbia*. Miller noted that, "there is nothing more injurious to Plants than Smoke, which will cause them to drop their leaves; and if it continue long in the House, will entirely destroy them" (Miller, 1752, n.p.). The first experimental steam heated hot houses did not appear until 1788, and this was not in widespread use until the 1830s due to difficulties in the manufacture of suitable iron pipes (Kingsbury, 1991, p. 298). The presence of steam and hot water heating allowed a cleaner, and more humid environment than that provided by a smoke-heated stove. This led to more successful plant growth in tropical species which originated from warmer, damper climates.

The growing environment was maximised and made as efficient as possible by the discovery that light penetration was optimised if glass was angled at 45 degrees, and that different levels

of humidity could be achieved by inserting glass screens between different portions of the stove (Miller, 1752, n.p.). Miller concluded that,

> "...by contriving the Green-house in the Middle, and one Stove and a Glass-case at each End, there will be Conveniency to keep Plants from all the different Parts of the World, which can be no otherwise maintain'd but by placing them in different Degrees of Heat, according to the Places of their native Growth" (ibid.).

It is therefore clear that by the mid-eighteenth century, the requirement to keep plants of different microclimates separate and in suitable growing conditions was recognised. This would have allowed a variety of plants to flourish, despite the continuing limitations of the bark or smoke-based systems.

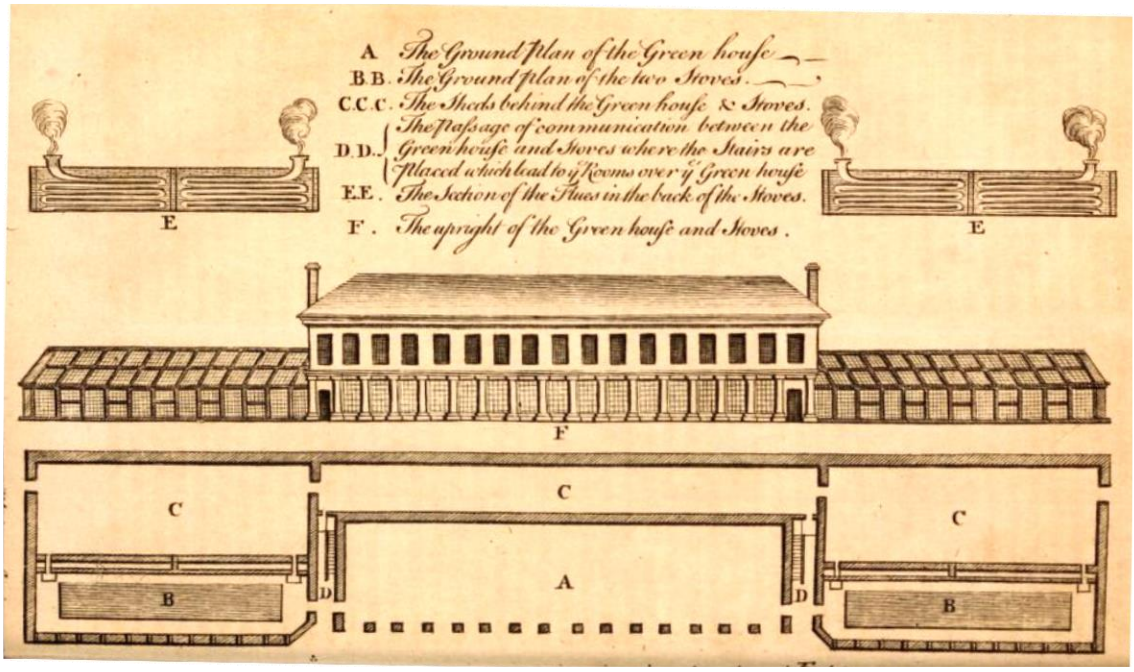


FIGURE 15: A DIAGRAM OF A GREENHOUSE AND ADJOINING STOVES FROM PHILIP MILLER'S 1754 EDITION OF THE GARDENER'S DICTIONARY. THE DIAGRAM SHOWS THE COVERED GREENHOUSE SECTION IN THE MIDDLE WITH LARGE WINDOWS AND ROOMS ABOVE, AND THE STOVES AT EITHER SIDE, WITH ANGLED GLASS ROOVES AND TAN BEDS IN THE INTERIOR. AFTER (MILLER, 1754)

In Repton's *Observations on the Theory and Practice of Landscape Gardening* (Repton, 1805), he noted how hot houses were integrated with the house and landscape in a variety of ways,

> "At Bowood, at Wimpole, at Bulstrode, at Attingham, at Dyrham Park, at Caenwood, at Thoresby, and some other large houses of the last century, green-houses were added to conceal offices behind them, and they either became a wing of the house, or were in the same style of architecture: but these were all built at a period when only

> orange trees and myrtles, or a very few other green-house plants, were introduced, and no light was required in the roof of such buildings. In many of them, indeed, the piers between each window are as large as the windows.
>
> Since that period, the numerous tribe of geraniums, ericas, and other exotic plants, requiring more light, have caused a very material alteration in the construction of the green-house; and perhaps the more it resembles the shape of a nursery-man's stove, the better it will be adapted to the purposes of a modern green-house.
>
> Yet such an appendage, however it may increase its interior comfort, will never add to the external ornament of a house of regular architecture: it is therefore generally more advisable to make the green-house in the flower garden, as near as possible to, without forming a part of the mansion; and in these situations great advantage may be taken of treillage ornaments to admit light, whilst it disguises the ugly shape of a slanting roof of glass.
>
> There is one very material objection to a green-house immediately attached to a room constantly inhabited, viz. that the smell and damp from a large body of earth in the beds or pots, is often more powerful than the fragrance of the plants, therefore the conservatory should always be separated from the house by a lobby or small anti-room. But the greatest objection arises from its want of conformity to the neighbouring mansion, since it is difficult to make the glass roof of a conservatory architectural, whether Grecian or Gothic" (Repton, 1805, p. 104).

Linking back to the previous chapter, Repton's observations highlight the various concerns present in siting a hot house, and that both style and functionality were concerns which did not always gel harmoniously. While a stove may have been a more suitable environment in which to grow plants, a greenhouse was more architecturally satisfying to place near a house, and different families would make different choices based on their motivations for planting; aesthetics or cultivation. The high light requirements of many new plant introductions necessitated a change in the style of growing houses for those who desired increasing success, and this had to be accommodated in the design of a growing space, particularly difficult in one attached to a house.

The challenges involved in growing new and unusual plants successfully were real, from transport, to skill and technology. This would have made the practice expensive. Rare plants were highly prized and fetched inflated prices, however their cultivation was a persistent cost. Keeping a hot house at a high enough temperature throughout the British winter would have been a significant undertaking. Bark had to be regularly purchased and renewed, and coal flues

had to be regularly stoked. Where the aesthetic greenhouses of many country houses could be stocked with plants of less-exacting requirements, specialist cultivation required skill and dedication.

THE GROWTH OF SPECIALIST PLANTS

An early pioneer of the specialist plant collection was Mary Somerset, Duchess of Beaufort. Chapter three described the sprawling structure of the garden at Badminton, the specialist garden areas and the siting of her greenhouse near to house itself. The duchess held an impressive collection of plants here, and also at her London Residence, Beaufort House in Chelsea. In 1699 Somerset built her first hot house which was of early design, Sloane called it a Stove, heated by the smoke from fires under two paved walks, and the roof made half of glass which could be raised to let in air and rain (Laird, 2015, p. 398). In 1703 James Petiver branded it 'matchless' (ibid., p. 66). Many of her plants were raised from seeds from exotic sources, including the Cape of Good Hope, the East Indies, the Caribbean and Virginia (Cottesloe, 1983, p. 9). Records show that plants came from many of the prolific collectors of the time, including John Ray, Robert Morison and Leonard Plukenet (ibid., p. 19), her supply route of botanists, gardeners and plant collectors ensured that she received plants from all over the globe (Laird, 2015, p. 75). Plants from George London of the Brompton Nursery included "great Lyllys" and a Magnolia virginiana from the West Indies (ibid., p. 86).

In March of 1701 Dr. William Sherard wrote from Badminton to Dr Richard Richardson, that,

> "I have been this six months here, in quality of compaynion to the young Duke of Beaufort, which I was the easelier induc'd to accept of, on account of the noble gardens her Grace, my Lady Duchesse, has; and truly in a few years they will out-do any yet in Europe, being furnish'd with all conveniences imaginable, and a good stock of plants, to which I have added above fifteen hundred, and shall daily procure more from my correspondents abroad" (Turner, 1835, p. 33)

Stephen Switzer, in *The Nobleman, Gentleman, and Gardener's Recreation* (1715), observed shortly after Somerset's death that,

> "What a Progress she made in Exotics, and how much of her Time she virtuously and busily employed in her Garden is easily observable from the Thousands of foreign Plants (by her as it were made familiar to this Clime) there regimented together, and kept in a wonderful deal of Health, Order and Decency" (Switzer, 1715, p. 54).

These observations and accounts of the plant collections build a picture of not simply plants augmenting the landscape, but a discreet, extensive and pioneering plant collection which included many recent introductions to Britain. For cultivation in the garden as a whole she employed a head gardener called John Adams, although she was noted to have kept an 'infirmary' for plants which were not thriving, which was tended to by an older lady referred to as Mary or Martha Marsh (Laird, 2015, p. 104). The duchess's record keeping with regard to propagation and germination requirements no doubt helped her cause, and enabled her to bring plants to fruition with greater rates of success.

Schiebinger (2004, p. 60) has suggested that the duchess's garden was primarily an acclimatization garden, where she attempted to grow and flower exotics in a climate to which they were not accustomed. This was in essence, however, no different to the cultivation aspirations of later growers. She was certainly a competent horticulturist, or at least employed them within her gardens, as many plants did indeed flourish. Hans Sloane is reported to have commented on her skill in growing tender plants, and that she brought them to greater perfection than those at Hampton Court or anywhere else (Cottesloe, 1983, p. 19). The plant paintings from specimens grown in the garden record a great number of tender species and those which are difficult to propagate and cultivate, including *Ricinus, Datura, Opuntia, Solanum* and *Echinocactus* (ibid., 1983). By 1707 she had flowered an *Aloe* in the glasshouse, the flower reaching fifteen inches long (ibid., p. 9), which would have been a great spectacle rarely seen, if ever, before. Somerset was the first person in England to grow the zonal pelargonium and *Comptonia peregrina*, the North American sweet fern, and she successfully fruited a guava tree (McClain, 2001, p. 120). The evidence for her plant collections points overwhelmingly to the exotic and wonderful, rather than the wider ranging collections of Burton Constable inclusive of natives, but demonstrates the key role played by wealthy patrons in developing knowledge about the global natural world. It set the tone for an early scientific approach to plant cultivation during the coming century. The evolution of the scientific approach within elite circles is significant and will be further discussed in the coming chapters alongside the relevant context of the dried plant collections and paintings.

Approaching his collection from a different angle, but also an enthusiast of the exotic, physician Dr John Fothergill (1712-1780) grew a great variety of plants within his sixty-acre estate and five-acre walled garden at Upton, Essex, including around 3,400 species of conservatory plants (DeLacy, 2016). John Coakley Lettsom published a catalogue of *circa* 740 plants in the stove and greenhouse collection after Fothergill's death which he entitled *Hortus Uptonensis* (c.1783). The catalogue lists nineteen species of cactus, four species of *Canna*, sixteen *Euphorbia* and a number of palms including *Chamaerops* and *Phoenix*.

Fothergill's collection was supplemented by his link with the prolific London merchant Peter Collinson, who was doubtless responsible for many of the plant introductions to Fothergill's indoor and outdoor collections during their relationship. Fothergill was also linked to the American colonies by being a political advisor to the Quaker members of the Pennsylvanian assembly and a trustee of the Pennsylvania Land Company, as well as providing medical assistance to Benjamin Franklin when he fell ill during a visit to Britain in 1757 (DeLacy, 2016).

Chapter three outlined that Fothergill's plant collections both inside and outside in his five-acre walled garden were particularly impressive. His garden contained an abundance of plants both native and exotic, and his hot houses are recorded as being spectacular,

> "...without exposure to the open air, a glass door from the mansion-house gave entrance into a suite of Hot and Green-House apartments of nearly 260 feet extent, containing upwards of 3,400 distinct species of exotics, whose foliage wore a perpetual verdure, and formed a beautiful and striking contrast to the shrivelled natives of colder regions" (Lettsom, 1786, p. 39)

Mrs Delany, a flower artist who will be discussed in chapter seven visited Upton in 1779 and recorded,

> "I took *my little bird*[8] and Mrs. Pott to Upton in Essex, 10 mile off, to Dr. Fothergill's Garden, crammed my tin box with exoticks, overpowered with such variety I knew not what to chuse!" (Delany in Chauncey Woolsey, S. (ed.) 1879, p. 340).

Fothergill was concerned with the wider cultivation of plants, beyond his own garden. Thompson's memoir of him noted that, "that he might have every chance of success in the propagating of new plants amongst us; he used to commit some of each sort, or of their seeds, to the care and management of his friend the late James Gordon, of Mile End" (Thompson, 1782, p. 20).

In Fothergill's memoir, a note attributed to Joseph Banks, explorer, naturalist and botanist, and Daniel Solander, naturalist and explorer, spoke of the extent of Fothergill's collections and their intention,

> "At an expense seldom undertaken by an individual, and with an ardour that was visible in the whole of his conduct, he procured from all parts of the world a great number of the rarest plants, and protected them in the amplest buildings which this or any other country has seen.

[8] Mrs Delany kept a pet bullfinch called Tony.

> He liberally proposed rewards to those whose circumstances and situations in life gave them opportunities of bringing hither plants which might be ornamental, and probably useful to this country, or her colonies" (Banks and Solander in Thompson, 1782).

Ornament was important to Fothergill, but useful and otherwise fascinating plants were particularly valuable. This is corroborated by significant numbers of plants of medicinal and economic importance cited in *Hortus Uptonensis* (Lettsom, c.1783), in addition to plants with additional interest such as independent movement. *Cinchona*, the plant from which quinine is extracted was present, and plants of economic note included sugar cane, cotton, coffee and chocolate plants, and plants of interest due to nastic movements[9] including *Mimosa pudica*, the sensitive plant; *Dionea muscipula*, the venus fly-trap; and *Hedysarum movens*, the telegraph plant[10]. Fothergill loved plants which were scientifically fascinating, or medicinally or economically significant.

Through his garden and his collecting contacts, Fothergill introduced about a hundred plants into cultivation in England (DeLacy, 2016). Despite the number of plants cited in *Hortus Uptonensis*, the catalogue does not represent the entirety of Fothergill's collections. In 1783 a letter from an R.A. Markham to John Coakley Lettsom he noted the publication of *Hortus Uptonensis*, but that,

> "…but am extremely sorry it is not to include the hardy plants and shrubs cultivated at Upton. A great many of them are, I believe, still growing there. If the work is not yet gone to the press, and he thinks it worth while to render his Hortus any further complete, I have a catalogue of a large number which I saw growing there previous to the sale, and which shall be much at his service" (Markham, 1817, p. 376).

Indeed, from further accounts we learn that the doctor was interested in wider botanical horticulture, not simply exotics. Thompson's memoir recorded that,

> "…his garden, formed upon this extensive plan, and yearly improving by large supplies of the more rare indigenous plants, and a profusion of new exotics, arrived at length to that pitch of excellent, as, in the opinion of the most competent judges, to be esteemed the second in Europe: the Royal Gardens at Kew alone deserving the pre-eminence" (Thompson, 1782, p. 21)

[9] Nastic movements are plant movements which occur in response to environmental stimuli – they can often be rapid and quite spectacular.

[10] Now known as *Codariocalyx motorius*, the telegraph plant has two small leaflets at the base of its larger leaves which constantly move to measure the intensity of sunlight and allow the larger leaves to be moved more slowly into a position which takes advantage of the current light strength and direction.

This high praise notes within it that indigenous plants were as much a part of Fothergill's great success in garden making as were his exotics, suggesting the use of the assemblage as a botanical collection.

Clearly, the garden and its collections were widely known, and Fothergill admitted visitors. In a separate account printed as a footnote in Thompson's memoirs, Joseph Banks and Daniel Solander noted that, "His garden was known all over Europe, and foreigners of all ranks asked, when they came hither, permission to see it" Banks and Solander in (Thompson, 1782, p. 39). An account of Fothergill's life in an edited edition of his published works recorded that,

> "His garden, at Upton, was very justly reckoned one of the first botanic gardens in Europe. Every plant that seemed likely to be of use in physic, or manufactures, was procured at any expence, and cultivated with the greatest attention. He had correspondents in every part of the world, who were continually furnishing him with new specimens of plants, shells, and insects" (Elliot, 1782).

The garden was referred to both here and in Thompson's (1782, p. 37) memoir as a botanical garden; the context of its discussion among that of his natural history collections, and the diversity of the collection suggest that it was indeed so.

Fothergill's collection embodies a number of important points in the history of plant collection. Firstly, collections of the period are diverse. Collectors brought their personal motives, experience, situation and passion to the practice, the professional man, Fothergill, seeking out plants which were economically or medicinally significant. Additionally, the recording bias is plain to see; only the particularly spectacular and exotic indoor collections were catalogued after his death, meaning that without the memoirs and correspondence highlighting his tendency towards the useful (for economic gain) and the indigenous (for scientific comparison) much of the substance and ideology behind his collection would be lost. Both Upton and Burton Constable are significant in this regard, highlighting the diversity in the full range of plants curated by their owners and therefore enabling a clearer understanding of the substance and reason behind the collections. An integrated study of collection evidence, including herbaria, can help to add to this picture.

Conversely, perhaps one of the most prolific but least understood collectors of the eighteenth century, was Margaret Cavendish Bentinck, the Duchess of Portland. Bentinck held a collection to rival that of Fothergill, however, despite our knowledge of her many plants as outlined in the last chapter, very little is understood about the make-up of the collections. The house and grounds were remodelled in the nineteenth century, leaving no record of their past use or plantings, and few contemporary accounts of the space remain. There is no list of plants from

the botanical garden, and the available sources are limited to evidence from the duchess's contemporaries (Festing, 1986, p. 196). It is known, however, that seeds and specimens were sent to the duchess from all over the world, assisted by her contacts in the East India Company and other trading ventures (Hall, 2016, p. 59). In his catalogue of the plants at the London Botanic Garden, William Curtis names the duchess as a donor of "many scarce and valuable plants, both british and foreign" along with the Earl of Bute, Dr Fothergill, Dr Pitcairn and Dr Lettsom (Curtis, 1783, p. 17). Laird (1999, p. 224) interprets the evidence as suggesting that the less valuable species were planted out in the woodland walks and the shrubberies, and the "taxonomic collections and rarities" were confined to the botanic garden.

The diary of Lybbe Powys recalls a visit to Bulstrode in 1769, in which we learn that, "her Grace is exceedingly fond of gardening, is a very learned botanist, and has every English plant in a separate garden by themselves" (Powys, 1899, p. 121). From this we can deduce that the duchess was interested not only in exotics, but also British plants, and cultivated them in a botanical manner in her garden. Hall (2016, p. 59) adds to the comprehensive nature of the collection, noting that the garden was designed to contain one of every known species of plant. John Lightfoot, the duchess's chaplain and botanical advisor was among her extensive number of contacts who helped to procure specimens for the garden. Many of her aristocratic friends including the King and Queen sent live plants as presents to be cultivated, (Stott, 2013, p. 45) .

While the evidence for the duchess's live collections is sparse, it is clear from the accounts that it was an impressive collection. The botanical nature of the garden and the cultivation of native plants in an ordered manner, even if it is not clear how these were structured, is informative. The practice echoes that of William Constable, with the living plants collected and arranged in a similar manner to curiosity cabinet collections as discussed below. That such a significant collection as the duchess's can disappear with little trace highlights the possibility that the practice was common at other locations, and the evidence has not remained.

While John Stuart, third Earl of Bute was keen on the landscaping of his grounds at Luton Hoo, the plant collection also commanded a significant part of the garden. Coats quotes one unnamed professional gardener as observing in the late 1770s,

> "…this is quite a new place and will be noble when finished, the project is to make an excessive large lake. There is here a great collection of Exotick plants, and a large Conservitory to plant in the natural ground most of the Cape plants … the house is very extensive as likewise the Botanick grounds" Unreferenced in (Coats, 1975)

In 1783, the *General Evening Post* reported that,

> "The botanical garden, in every part but in the morass and the aquatic plants, is very complete. The rock is excellent: the conservatory is perhaps the most perfect in the kingdom; there are in it three divisions of sixty feet each, with breadth and width in proportion" (General Evening Post, 1783, p. 65)

In his *Memoirs of a Traveller*, Louis Dutens (1730-1812), the French traveller and writer who spent most of his life in Britain, reported a visit to Luton Hoo, and commented on the botanical garden,

> "...near the house is a botanical garden of thirty acres, the expence of which alone exceeds a thousand pounds a year. Lord Bute is one of the greatest botanists of the age: he has collected, with incredible pains, all the rare plants of the earth into his garden, and the most scarce trees into his park" (Dutens, 1806, pp. 113-114)

Unlike the garden and house of the Duchess of Portland which were full of people, study and gaiety as we will see in the next chapter, Luton Hoo seems to have been far more sombre, the earl increasingly distancing himself from society after falling out of favour with George III in 1766 (Coats, 1975, p. 43). He withdrew from public life to intellectual pursuits and lived the later part of his life mostly at Highcliffe, having his plant collection moved there from Luton Hoo (ibid., p. 44).

At Highcliffe Stuart built a conservatory nearly 300 feet long, the plants planted in soil rather than in pots (ibid.). Interestingly this echoes the account of the unnamed gardener above, who recounted the conservatory at Luton Hoo having plants in the 'natural ground'. As this was not the usual technique of the time, it is reasonable to assume that it was the earl's preference, or that of one of his advisors. The new garden also contained a four-acre outdoor area for hardy plants (ibid.). This is perhaps the "botanical garden" referred to by Samuel (2010, p. 12) in her account, which she notes had high walls to protect the new plant specimens just reaching the country and coming into Stuart's possession. She also states that sections of the garden were created for experiments, similarly to at Kew but on a smaller scale, and that large greenhouses protected tender plants (ibid., p. 13). The earl's collections were impressive, extensive, and like Constable's, Bentinck's and Fothergill's, were botanical in focus.

Stuart's case highlights a further issue in the accurate recording of historical plant collections, that if there is significant alternative substance to record within the life of an individual, or if their primary concern was within another field, their scientific, botanical and collection activities often get overlooked or disregarded. A further, potentially more divisive limiting of individual's contribution to science has been suggested by Miller (1988, p. 214), who believes that Stuart, a Tory, was written out of eighteenth-century botany by later Whig historians who

wished to define the subject in their own image. It is possible that the plant collections at Highcliffe were of greater importance and scientific use than has endured in the literature.

While the examples above provide the most well documented and often-cited examples of early modern plant collections, it is likely that the practice was much more widespread, but is now little understood due to poor survival of evidence in the historical and archaeological record. For example, Richard Mead (1673-1754) was an English physician and prolific collector whose plant collections are elusive and rarely mentioned, despite ordering 200 botanical drawings in his later years from the botanist and entomologist Georg Dioysius Ehret (Calmann, 1977, p. 65). Other collections are known from fleeting references in correspondence and catalogues, but are easily overlooked. Ehret recorded that he spent several weeks every year with his friend Ralph Willett at his Dorset estate at Merly, who, Ehret noted, owned more than 300 of his flower pictures, generally of Willett's own plants which he kept in his hot houses (ibid., p. 66). The sale catalogue of the paintings and the account by Ehret is the only record which has been traced of what must have been an impressive plant collection. Similarly, it is known that the plantings at Oatlands Park in Surrey contained an enclosure of exotic plants accompanied by boards bearing their name (Laird, 1999, p. 67). Whitton in Middlesex, also, contained gardens of choice exotics and a significant array of greenhouses, hotbeds and stoves (Symes, et al., 1986, p. 143), whilst Petworth even had a garden dedicated to the *Aloe* (Laird, 1999, p. 136).

Further case studies with potential botanical links exist for further study. Painshill Park, the garden of Charles Hamilton in Cobham, Surrey was well-known for its exotic collections within the landscape, but also housed botanically focussed collections. In a letter to Abbé Nolin, the French nurseryman, Hamilton mentioned that he was going to compare Nolin's trees with his own by planting them alongside one another and taking equal care of them (Symes, 1983). Exotic trees and shrubs were also planted within the pleasure garden at Painshill, in addition to the 'orange garden' – an area for growing and displaying choice exotics (Laird, 1999, p. 12). Similarly, Robert James (1713-1741), eighth baron Petre held impressive arrays of exotics at his estates at Thorndon Hall and Worksop Manor. He planted over 40,000 trees, 10,000 of them American species, at Thorndon Hall before he died at the age of 29 (McLean, 1984, p. 36). He was so keen on exotics in 1731 at the age of only eighteen he was the largest subscriber to the Caribbean collection expedition of William Houston (McLean, 1984, p. 36), and had a particularly extensive array of stoves and tender plants (Symes & Harvey, 1996, p. 274). In 1736 Philip Miller created a catalogue of Petre's extensive plantings at Thorndon, amounting to 696 genera and 1745 species (ibid.), an impressive collection.

Equally, Cannon Hall in Yorkshire is a little published but fascinating garden with parallels to Burton Constable. The garden was designed for John Spencer by Richard Woods in 1760 and

has been identified by Laird (1999, p. 303) as representing a unification of exotic collections and wider planting compositions. Two distinct areas are identifiable, one, like Constable's, near the hot house for the cultivation of "rare flowers, small exotic shrubs and tender plants; the other located further from the house, for common flowers, clumps of evergreens, and flowering shrubs, roses, fruit trees, and hardy specimens dotted over lawn" (ibid.).

The fact that there was a commonplace distinction between different garden areas and their planting characteristics is fundamental to our understanding of the use of exotics and plant specimens within an eighteenth-century garden. Differences between the flower garden and pleasure garden were identified in 1757 by John Hill (c.1714-1775), English botanist and author of *Eden*,

> "The Flower Garden and the Pleasure Garden, though usually considered as the same, are properly distinct: we do not mean by this that Flowers should not be planted in Pleasure Gardens; but that there should beside this be a particular Piece of Ground for the Beds of the select Kinds" (Hill, 1757)

The concept of this distinction has been explored by Laird (1999) in *The Flowering of the Landscape Garden*. He considers the flower garden to have been an ornamental space composed of curious flowers, distinct from the wider pleasure garden. The flower garden would be defined by the interests of the owner, whether erring on the side of the ornamental, or indulging in the curious. Brown and Williamson (2016, p. 121) identify these areas as displaying aspects of the new world, revealed by European expansion. These terms must be used with caution, however, as they were not used consistently by designers and owners, and visitors did not make distinctions between different parts of the garden (Laird, 1999, p. 8).

Laird's flower garden brings together an eclectic mix of gardens spaces which were variously defined by their owners based on a plethora of desires and abilities. It may have denoted an area composed mostly of flowers and set aside from the remainder of the garden primarily for aesthetic purposes, or one in which specimen plants were cultivated and study. If termed a botanical garden, this more definitely related to an area composed mostly of plants intended for classification and scholarship, although it should be strongly noted that in many cases these two concepts overlapped and the use of one term does not preclude the characteristics of the other. Whilst not without problems of interpretation, the understanding that this distinction did exist provides the garden-based context for a discussion of plants as collections. The flower garden is the theatre in which the outdoor cabinet of curiosity was constructed, and there were few as impressive and as well documented as that at Burton Constable.

BURTON CONSTABLE

The survival of evidence at Burton Constable and the lack of political bias mark out the collection as a unique window through which to view the collections of one particular individual. Certainly each personality would have brought their individual motivations, ideology and approach to their plant collection. At Burton Constable, the large stove and greenhouse, coupled with the walled botanical garden discussed in chapter three points to a significant plant collection. Naturally, none of this collection remains, therefore evidence must be gleaned from correspondence, notebooks, plans and bills of purchase. It is argued here that the living plant collections at Burton Constable formed an integral part of the same framework of interest and inquiry as the static collections within the house. This collection, with direct comparison to the *hortus siccus*, consisted of a wide variety of plants from the curious and exotic to the common and native. The evidence for the living plants themselves predominantly comes from bills of purchase and correspondence, but information can also be gleaned from the *hortus siccus* and a little of their purpose is apparent in the published record of William Constable's commonplace notebooks.

Constable clearly went to great effort and expense to pursue the effective cultivation of his plant collection; his facilities provide us with an indication of the scale of his intention. Growing plants with different climatic requirements to those found in Britain requires significant investment of time and funds, and Constable spent heavily on the resources needed to do so. As discussed in chapter three, he built two large stoves to provide protection and warmth, one in the late 1750s on the west lawn and a replacement in the late 1760s of early 1770s a quarter of a mile away from the hall to the north west when the original was removed. Both stoves were impressive building projects, but the former shown in figure 9 was larger. It had two stove ranges either side of a central greenhouse. The stoves employed the latest technology of the time, flues circulated warm air from fires in the back shed via a series of flues, and large tan beds provided ample space for planting (see figures 16 and 17). The tan beds would provide extra warmth and allow pots to be sunk within them for root heat[11] and effective moisture control[12]. Gangways at the front and back allowed movement around the stoves, and a colonnade of decorative archways and shelves built into the structure allowed pots of plants to be arranged for a pleasingly aesthetic display (fig. 18). The greenhouse measuring 20 by 22 feet in the middle of the two stove ranges was in a Palladian style and would allow plants which would tolerate more cold, but not that of an East Yorkshire winter, to be brought inside over

[11] Tanners bark, beast hair (probably from cattle) and the manure it would be mixed with gives off heat during decomposition.

[12] Ceramic pots breathe from the sides so sinking into a substrate reduces moisture loss. Additionally, the contact of the internal growing media with the sub-base of the tan bed would allow water movement between the two by capillary action and provide a more stable moisture content and root environment.

the colder months. On the plan, adjacent to the small greenhouse in the middle, are rooms for the gardener, and a 'Master's roome' which included a fireplace (figure 19). It is unlikely that the head gardener would be referred to as a Master, therefore this was presumably a room especially built to allow William Constable to study close to his collections.

The stove and greenhouse range measured sixty-two metres in length, with additional fire walls extending on each end. It would have taken significant investment of resources to maintain its heat and functionality, and to stock with plants. In 1760 Constable paid for 'blue slates for the stoves' (ERRO DDCC/153/51/18-29, February 1760), presumably to top the flues or create the floor. After the stove's completion his carefully archived vouchers repeatedly show large purchases of tanner's bark and 'beast hair' which would have been necessary for the cultivation of plants in the tan beds. A 1763 order for 26 loads of tan and 100 stones of hair came to thirteen pounds and eight shillings (ERRO DDCC/153, 1760-1763) more than half the gross annual income of the average working-class person. Constable wasted no time in stocking his new stove with plants, an order from 1759 included eight *Aloes* of four different types (ERRO DDCC/153/51/18-29, January 1760). In 1761 Thomas Kyle, Constable's plant specialist bought a number of items for the stove from an unidentified merchant called Robert Forster. The items included clips for the wall trees, two watering pans, a wooden dish for the use of the stoves, a lock and key for a drawer in the stoves and a sponge (ERRO DDCC 153/52/16, 1761).

As discussed in chapter three, this early stove was located within a walled area which Constable termed the 'stove garden' (figure 8), where he grew and managed a collection of hardy exotic plants and wildflowers. The plan of the stove garden shows it to be approximately one hundred and thirty metres long by eighty-four metres wide, almost three acres. This is an extremely large area for cultivation, although it is possible that vegetables were also grown here. The plan of the stove garden shows the siting of the stove within it, on the north side facing south. In front of were further beds, presumably for choice specimens, defined from the four larger growing areas. The whole is surrounded by a wall with a dividing wall creating two areas, possibly to separate ornamental plants and edibles. The juxtaposition of the stove, stove garden and house is significant, and will be discussed below.

Within any garden, but particularly when aiming to cultivate tender plants, the necessary staffing and knowledge is vital. Constable repeatedly used Thomas Knowlton to oversee horticultural and building works on the site. Knowlton was a renowned horticulturist and garden designer who had worked for the apothecary and collector of curious plants James Sherard (1666 – 1738) in London before taking up a post at Londesborough Hall in East Yorkshire as head gardener to the third Earl of Burlington (Henrey, 1986, p. 17). Sherard had a generously stocked garden at his house in Eltham, Kent containing plants from all over the world. Here Knowlton gained vast amounts of knowledge on the growing of exotics, and later

applied these to his situations in the north. In addition to his work at Londesborough, he was employed as a horticultural consultant (Henrey, 1986, p. 16), liaising with his contacts in London and advising clients in the north, which by 1758 included Constable.

Knowlton corresponded widely with parties interested in horticulture at the time; many letters survive demonstrating the breadth of his endeavours (ibid., p. 15). He also took in botanical and horticultural literature written in English and shared his knowledge generously with others (Laird, 2015, pp. 142-145). It is unusual to find such a body of information for a gardener's work, and it is particularly interesting to note the scope and the application of his knowledge. On his death he was mentioned in the *Transactions of the Horticultural Society of London* in 1808, where he was referred to as 'that famous gardener' (Salisbury, 1812, p. 103). He was well connected and also had an interest in natural history including fossils. Interestingly, he was connected to Emmanuel Mendes da Costa, who provided William Constable with specimens and advice on fossil collecting and who will be discussed further in chapter six.

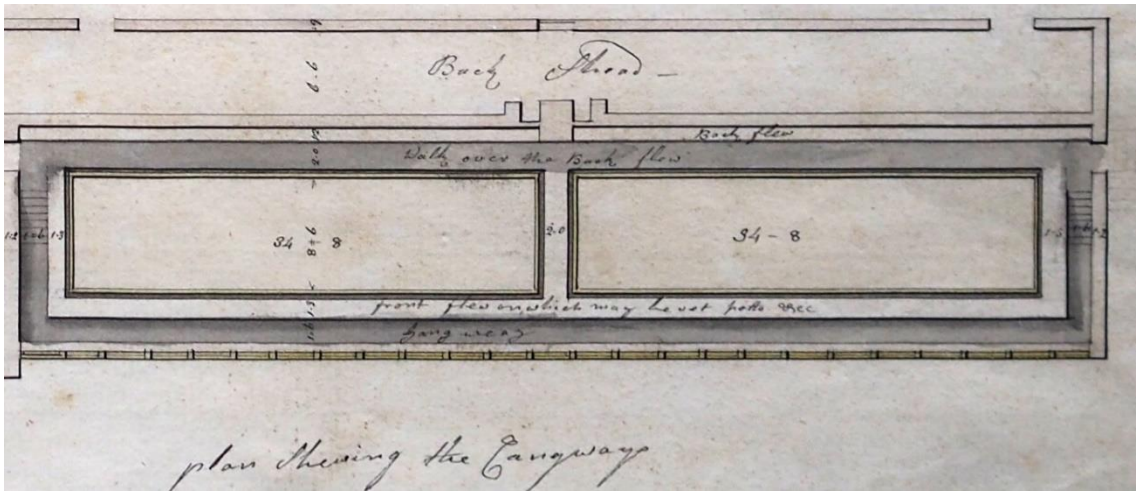


FIGURE 16: DETAIL OF THE 1758 STOVE PLAN SHOWING THE LAYOUT OF WALKWAYS AND GANGWAYS OVER FLUES, THE TAN BEDS AND PLANT SHELVES (BURTON CONSTABLE HALL, 1758)

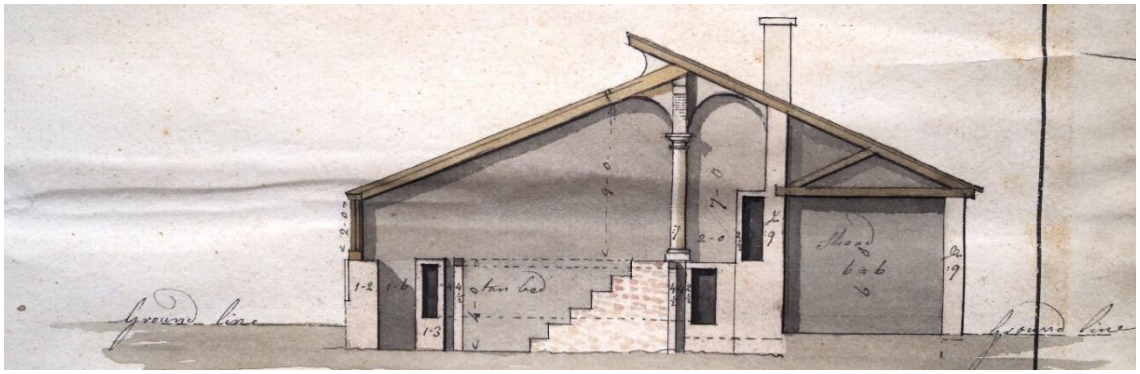


FIGURE 17: DETAIL OF 1758 STOVE PLAN SHOWING A CROSS SECTION THROUGH THE STOVE HOUSE, INCLUDING THE GANGWAYS, FLUES, SHELVES AND TAN BED (BURTON CONSTABLE HALL, 1758)

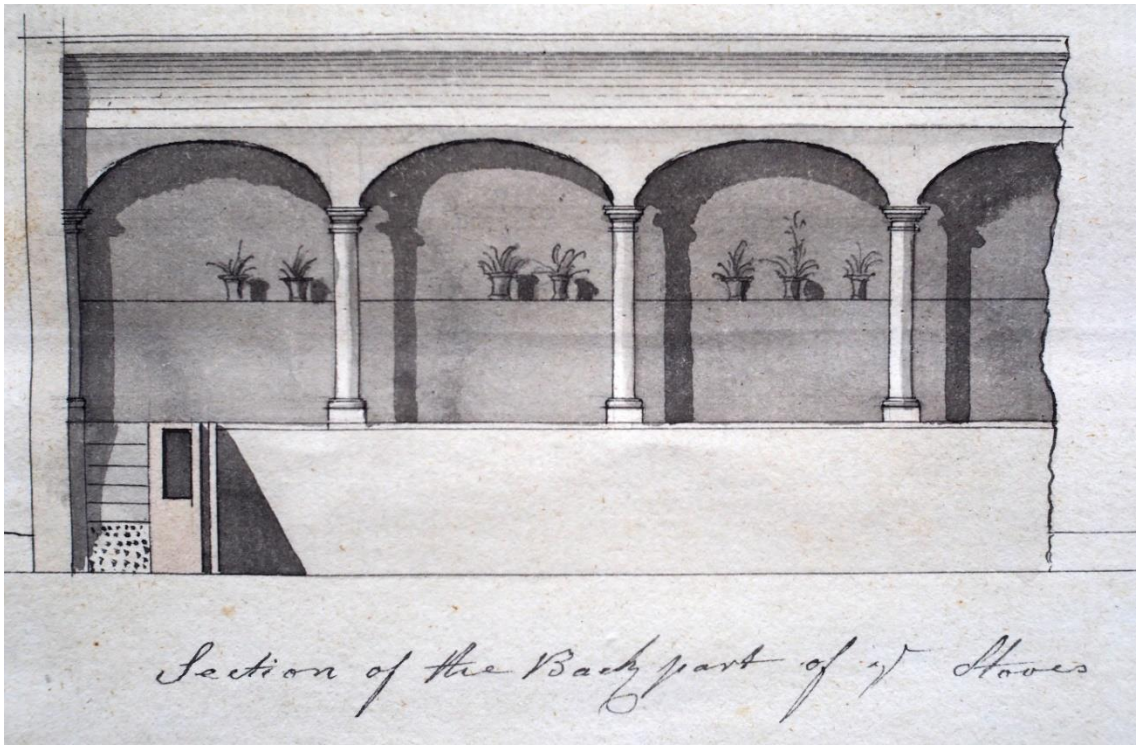


FIGURE 18: DETAIL OF THE 1758 STOVE PLAN SHOWING THE ARCH COLONNADE AND SHELVES FOR PLANTS TO BE EFFECTIVELY DISPLAYED IN POTS (BURTON CONSTABLE HALL, 1758)

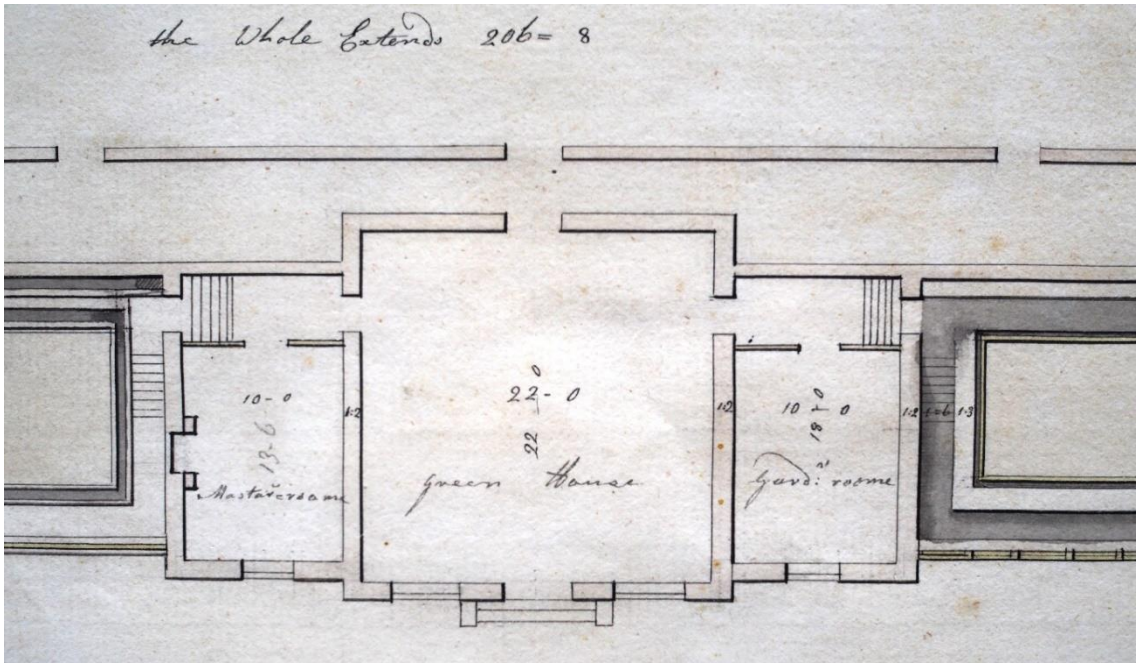


FIGURE 19: DETAIL FROM 1758 STOVE PLAN SHOWING THE CENTRAL GREENHOUSE WITH 'MASTER'S ROOM' (WITH A FIREPLACE) AND 'GARDENER'S ROOM' (BURTON CONSTABLE HALL, 1758)

In 1760 Knowlton invoiced Constable for providing designs for a menagerie (ERRO DDCC/140/2). Accounts suggest that it contained an aviary, and housed amphibious and land animals (Turnbull, 1998, p. 13). Exotic animals and birds had been of interest since the mid-seventeenth century, and by the mid-eighteenth were often the occupants of menagerie buildings in the gardens of the gentry, collected and displayed for the interest of owner and visitors (Plumb, 2015, p6.). In parallel to the first stove complex, Turnbull (1998, p. 13) suggests that the menagerie did not survive for long and was soon converted into accommodation. In 1761, Knowlton was still working at Burton Constable on the stoves, invoicing for "attending the bricklayers to the scaling out of the fire wall, & inspection & direction" (ERRO DDCC/153/52) and then again in 1762 (ERRO DDCC/153/52), possibly to build the firewalls on each side of the stove complex. These were clearly significant works and required specialist supervision in addition to extensive labour. The requirement for specialist employees also endured beyond the building of the stove complex to its maintenance and the cultivation of plants within.

Constable's gardeners, Thomas Kyle and Robert Peacock, were central to maintaining the collection. Kyle was a plant enthusiast and was tasked with researching agriculture and horticulture for Constable. An undated booklet in Constable's hand includes instructions of places to visit and subjects to research during a trip to south east England. The document must date from Kyle's employment at Burton Constable between the late 1750s and 1768 and is informative on the husbandry and cultivation issues in which William was interested. They include the functional and land-based,

> "If the method of sowing turnips in Drills is more Esteem'd, Inquire Which Distance the Drills are plac'd from each other? Whether Horse-hoeing is thought necessary, if it is thought to be necessary, Inquire how often & at What times" (ERRO DDCC/145/4, n.d.).

Wider landscape issues,

> "Pay Great attention to all Plantations observed Particular those Planted to imitate Hills, take account of the variety of the plants from the Lowest to the highest. Those Compos'd of the most hardy & Common trees fitted for us" (ERRO DDCC/145/4, n.d.).

And plant collections,

> "Observe if in the stoves are any fine new Plants. ask Gordon after his Umbrella tree" (ERRO DDCC/145/4, n.d.).

All aspects of Constable's estate were important, part for supplying the house with fresh food, part for adherence to fashionable landscape and part for his interest in plants and collections.

His investment in what was essentially a study tour for his gardener points to his commitment to the latest practices in cultivation and his curiosity in all things new.

Kyle duly took note of his employer's wishes and kept a written account during his tour. From his travels in the south including Thorndon Hall in Essex, Burwood, Painshill, Weybridge, Claremont, Esher Place and Hampton Court in Surrey, he reported back a number of interesting observations on the technology and tastes of the gardens he visited. The following account is of the garden of the late Lord Petre at Thorndon Hall:

> "One Exotic Stove ye fronts Glass 6 foot high at [?] round the pit two foot Broad pit 10 foot Broad. The hight of ye Stove. 15 foot. Lenth 60 foot ye whole of the plants in this Stove are Infected with the white Insect, here is one old plumeria, the leav's of which are intire, spear shap'd, about Eight or 9 inches in Lenth, 3 broad which an acute point. Wm. Miller The Gardener says that it flowers Every year, and ye flowers are of a Scarlet Colour, and he calls it ye Scarlet Jasmine.
>
> I am not sure, But I think the same specie is in ye Stoves at Burton C. here is two plants of the Sea Side Grape, they are in poore health, as is the one at Burton." (ERRO DDCC/150/294)

Kyle also wrote about outdoor collections, including an account of sowings of 'Large Quantitys of Hardy American Evergreen and Deciduous trees and shrubs' (ERRO DDCC/150/294) and how they germinate and grow on the clay soil of the area. Kyle also commented on the range of plants grown in all the gardens he visited. Of Painshill in Surrey, seat of the Honourable Charles Hamilton, he stated,

> "...the Kitchen Garden is a great way from the House in a Low Clay, wheir there is a Stove but nothing in it that Signefys, here is a good large Green House upon the high Ground and near the house there is a great many of old orange trees one of which is 14 foot high with several other plants but no Great Collection." (ERRO DDCC/150/294)

He was, however, impressed by the vineyard on the site. He noted that the pineapple plants were poor at Claremont, but that Mr Greening of Eshea 'has the Greatest Quantity of fire walls that I have seen in any place' (ERRO DDCC/150/294). The Greenings were a nursery owning family based at Brentford End, who also gardened for Royalty (Bott, 2010). Kyle's account must have given Constable a great deal of information about the possibilities and trends of the time, although he was seemingly not inclined to visit the sites for himself.

For a period of around 12 years from 1758 to 1770, Constable had the infrastructure and the expert staff in Thomas Kyle to grow exotic plants to a high standard. His facilities were as

advanced as those of his contemporaries and Constable was also able to fund his passion for plants, buying specimens from the top nurseries in London and from dealers. He sent Kyle on a national tour to examine practices and success across the country and was attentive to all aspects of his extensive collection. It was not until William's health began to fail and Kyle left his employment that Constable began to wind down his investment and move his stove and dry house to a new position further from the house.

Thomas Kyle left Constable's employment in the late 1760s. His immediate destination is not known, however, in his 1783 publication on the management of peach and nectarine trees (Kyle, 1783) he was referred to on the title page as "gardener to the Honourable Baron Stuart of Moredun", to whom the work is dedicated. He noted his employer's promotion of the science of gardening, and wrote in the dedication that "your liberality in every point has much encouraged me in pursuing the various branches of my business in your service" (ibid., pp. 5-6). For a gardener to be published was rare, and he even gained enough notoriety to be mentioned in Loudon's (1825, p. 1109) *Encyclopaedia of Gardening* as "one of the first gardeners in Scotland of his time". Kyle was clearly an ambitious young gardener, and it could be read from the timing of his departure from Burton Constable that he understood that there was to be less specialist and exotic plant care following the relocation of the stoves and moved elsewhere to maintain the challenge in his job and development of his career.

There is little surviving account of the plants in the later stoves following the movement of the first stove range and the departure of Thomas Kyle. This change in the late 1760s and early 1770s, following Constable's grand tour and the invitation of Lancelot Brown and Thomas White to advise on the estate marked a considerable shift in priorities and style. Significantly though, Constable maintained his love and collection of plants throughout his life within varying manifestations. His interest in the exotic remained in the landscape and certainly the cultivation of exotics persisted in the new stove. The records of plant purchases and cultivation can add to a more thorough understanding of Constable's garden, collections and motivations.

PLANTS

Throughout the periods of Constable's earlier stoves (1758 to 1770) and later stoves (1770 onwards), he had significant success at growing exotic and hardy plants both outdoors and indoors. Vouchers show that Constable purchased plants and seeds enthusiastically. Many of these were for his kitchen garden, the purchase lists showing that he regularly bought a wide variety of plants to cultivate for his table. These include peas, beans, onions, leeks and carrots, as well as cucumbers, caraway, scorzonera, endives and salsify (ERRO DDCC/153/52/17-29, December 1762). He also purchased many plants grown for their ornamental qualities both indoor and outdoor, and many plants which were neither edible or aesthetic, but more notable for their novelty, particularly interesting qualities or botanical interest.

The purchase lists of plants, available with Constable's other bills of purchase at East Riding Records Office, are extensive. One of the earliest came from Christopher Gray on March 3rd 1759. Gray was a member of a plant selling family in London who had taken on part of Bishop Compton's extensive and exotic Fulham Palace plant collections after his death in 1713 (Griffiths, 2015, p. 204). The family stocked exotic species and were noted for distributing one of the first *Magnolia grandiflora* available in Britain (Griffiths, 2015, p. 204). Indeed, a magnolia was one of the plants included in the bill to Constable, and was by far the most expensive of the plants purchased at £2. The plants purchased from Gray are listed in appendix 1, and comprised a range of trees, shrubs and herbaceous plants including a medlar, a scarlet horse chestnut, a pawpaw tree, two tulip trees and a giant fennel (ERRO DDCC/153/51/14, 3 March 1759). The expense of the magnolia may have prompted Constable's urging of Thomas Kyle to "Take Great notice of many Magnolias of the Smell Kind rais'd in the open air in a bed of Clay" (ERRO DDCC/145/4, n.d.) at Thorndon Hall on his aforementioned research trip.

Other nurserymen with whom Constable frequently traded included John and William Perfect of Pontefract, Telfords of York and Robert Black[13]. The Perfects supplied most of the vegetable seeds for Burton Constable in addition to other choice seeds. One bill from December 1762 contains eighty-seven different varieties of plants and seeds, including seed of five different types of onions, seven different types of lettuce and four different types of cucumber as well as seed of ornamental plants including:

> Fine Double Strip'd Balsam Seed
> Bloody Walflower Seed
> Carnation Seed
> Amaranthoides Seed
> Egg Plant Seed
> Capsicum
> Sensitive Plant Seed
> Fine Narrow leav'd Indian Pink Seed
> Fine Broad leav'd Indian Pink Seed
> Egyptian Minionet Seed
> A Large Collection of Annual and Biennial Flower Seeds in Sorts
> (ERRO DDCC/153/52/17-29, December 1762)

Robert Black provided plants rather than seeds, including "Strip'd American aloes", "6 yellow jessamines" and "6 spanish brooms" (ERRO DDCC/153/51/18-29, January 1760). Constable's plant lists include a wide variety of plants bought in a variety of forms. Plants often arrived as seeds, roots or bulbs, including "500 Crocus" and "40 large hairy hyacinth roots" (ERRO

[13] Location not known

DDCC/153/52/1-16, March 1760). Additionally, the "8 baskets of asparagus plants for forcing" (ERRO DDCC/153/52/1-16, March 1760) suggest a skilled horticultural team. Of particular interest in this list is the 'sensitive plant' seed, presumably seed of *Mimosa pudica*. The plant is challenging to grow and not typically beautiful, however does exhibit a rapid nastic movement when touched, the leaves folding up on themselves in a matter of seconds. Many plants-people and botanists of the time were fascinated by plants which exhibited movement, and *Mimosa pudica* is one of the most striking examples. Mimosa is not the only plant exhibiting a nastic movement which is known to have been of interest. Constable's relationship with Jean Jacques Rousseau will be more widely discussed in chapter five, but the small section of botanical discussion between the two gentlemen contains mention of a plant which is also curious in this way, the venus flytrap. Other plants may have been bought for their particular botanical interest, including the fine and broad-leaved pink seed (*Dianthus*); purchase of both varieties suggests an interest in finer botanical variation.

Botany and scientific investigation do not appear to be the sole driver of Constable's living collections, however. Pineapples were a common crop grown in hot houses of the time and Burton Constable was no exception. Accounts exist of many purchases from large houses around the area, particularly from Castle Howard. Robert Teesdale, the head gardener at Castle Howard was renowned for his success at growing pineapples, and Thomas Kyle is known to have made visits to the garden (ERRO DDCC/153/52/17-29, September 1763; ERRO DDCC/153/53/1, May 1764). On one particular occasion in October 1763, Constable paid Robert Teesdale for:

> "18 fruiting pine plants at 5s
> 6 fruiting sugar loaf pine plants at 7s/6d
> 1 plumeria obtusa[14]
> Gossypium arboretum with woolly leaves"
>
> (ERRO DDCC/153/52/17-29, October 1763)

The purchase of so many pineapple plants at once suggests that the motivation was gustatory or aesthetic in addition to the botanical interest of various varieties of the same plant. Constable may also have been pursuing the status to be had in having so many fruiting pineapple plants at one time. Sugar loaf pineapples have whiter flesh and are sweeter than the yellow pineapple, they were more expensive, and it is interesting to note that there is selection for taste within the race to grow exotics. To purchase twenty-four plants at one time would have required a significant amount of space in the stove. Additionally, the stove at Castle Howard must have been growing a significant number in order to sell such a large quantity.

[14] A frangipani native to central America

The purchase of *Gossypium* from Teesdale is also interesting from a different perspective; it is the plant from which cotton is made. The plant is not aesthetic in itself, so it is likely that Constable was interested in it for its exoticism, or for its economic impact - sugar cane was another economically significant crop present in Constable's dried collection (Burton Constable *Hortus Siccus*, 1742 to 176?, p. Vol. 1). Equally, the purchase may be based in the economic curiosity surrounding a plant able to produce material which could be turned into thread.

Many of the plants discussed above had been sourced relatively locally from neighbouring estates, seed suppliers and nurseries. The range and availability of plants in the north, and the extent to which Constable was able to source a rich and diverse array of plants in both seed and herbaceous form is representative of the vibrant economy surrounding the river Humber. Despite this rich seam of opportunity, Constable desired more and regularly purchased plants from elsewhere, including London. His agent in London, John Dunn, often sent plants and information about their availability. In June 1761 he sent a list of plants "tho' not great Beauties, yet do not shew il intermix'd with others & they might be sent with those in autumn" (ERRO DDCC/145/1, June 1761). He noted that the final two, *Mesembryanthemum tenuifolium*[15] and *puginiforme*[16] were greenhouse plants and "all are now in Blow" (ERRO DDCC/145/1, June 1761).

In 1761 Dunn arranged the delivery of an *Arbutus* from James Gordon. Gordon had previously been gardener to Lord Petre, an early contact of Constable, and went on to set up his own plant business after Petre's death, culminating in his well-known nursery at Mile End in London (Chambers, 1993, p. 142). Gordon billed Constable for the *Arbutus*, or Adrachne as he noted it, in April 1761 (ERRO DDCC/145/2). Dunn then wrote to Constable,

> "I am glad Mr Gordon was punctual in sending the Adrachne: I fear I express'd myself wrong in a former letter in his regard". (ERRO DDCC/145/2, May 1761)

The purchase of an *Arbutus* highlights Constable's desire and ability to procure the new and the novel. *Arbutus* had not long been introduced to England from Aleppo in 1754 (Calmann, 1977, p. 64), with Pulteney noting in his *Historical and Biographical Sketches of the Progress of Botany in England,* that Dr. Fothergill was the first to flower the "*Arbutus Adrachne*" in 1766 (Pulteney, 1790, p. 292). If Constable had success with his specimen it is likely that it would have flowered earlier than Fothergill's, but whether floriferous or not, the collections at Burton Constable were clearly keeping pace with botanical introductions.

[15] An unresolved name for a type of *Mesembryanthemum* which does not have a currently accepted synonym (The Plant List, 2013)b
[16] *Conicosia pugioniformis* (The Plant List, 2013)*a*

Dunn went on to share information about how he had seen pomegranates growing, even though he was uncertain of their cultivation requirements,

> "I have seen many of the Double Pomegranates in Douay; they placed them, like Orange Trees, in Tubs; But whether this for the Convenience of Bringing them into Churches on Festivals, the Flower being Bold and Shewy; or that they might be placed in a Greenhouse for the winter, I know not". (ERRO DDCC/145/2, May 1761)

A number of letters exist from John Dunn on the subject of plants, particularly from the early 1760s. Constable used him to procure plants and seeds very much in the same way as he used Emanuel Mendes da Costa to send fossils and shells for his cabinet which will be discussed in later chapters. In July 1761 Dunn wrote,

> "I will add a long list of seeds, and keep a copy by me, so that you will have only the trouble of adding to it, or expunging what you dislike…It was assumed when you mentioned oaks that you only had the common sorts" (ERRO DDCC/145/1, June 1761).

He was evidently visiting plant and seed suppliers in London for a list of possible acquisitions and information, then sending lists to Constable for his word on whether to purchase and send to Burton Constable. The letter above then lists a number of plant species available, split into the categories of evergreen trees, deciduous trees, curious shrubs; evergreen and deciduous shrubs. He noted that

> "N.B. Sometimes there are other kinds of Tree and Shrub Seeds sent from America, but the above mention'd are mostly to be Depended upon" (ERRO DDCC/145/2, 20 July 1761).

The list of plants is from "Messrs Lee and Kennedy", of whom he noted, "I think they will deal honestly" (ERRO DDCC/145/2, 20 July 1761). Lee and Kennedy had a nursery in Hammersmith in London of great reputation (Chambers, 1993, p. 141). The nursery would have received regular shipments of new seed from America, some regularly available and some less reliable. Two years later, however, Dunn wrote to say that,

> "I have seen Mr Kennedy who says, as your last list of seeds were mostly American he could not then send them in any quantity: many are just arrived, wch if they prove such as were mentioned at that time, he will send them soon" (ERRO DDCC/145/2, 1 May 1763).

In is interesting to note that Constable was requesting seed in a greater quantity than could be provided at that particular time from the American shipments. In some cases he evidently

required quantities of plants, rather than simply single specimens. In 1760 he ordered ten *Spiraea*, nineteen *Hypericum*, nineteen evergreen privets and twenty lilacs (ERRO DDCC/153/51/18-29, January 1760). This echoes Laird's identification of plant buying habits; cheaper and more widely available plants were bought in larger quantities for wider horticultural display, some were bought as individuals for their novelty as specimens (Laird, 1999, p. 231).

Overall the plant bills represent a wealth of horticultural interests in spheres including fruit and vegetable cultivation, the large-scale planting of trees and shrubs like the privet and lilac; specimen trees and shrubs like the magnolia and *Arbutus*; exotics like pineapples and plumeria; ornamental seeds and roots like wallflowers; plants of economic interest like cotton, and plants for scientific interest like the sensitive plant. It is clear that Constable was keen on building his collections for reasons other than subsistence and ornament. The lists above include plants which would happily grow outside in the East Yorkshire climate, especially given that Burton Constable was near to the coast and so benefited from a little frost protection, as well as those which would require a significant amount of skill and investment of time to cultivate and keep at the required temperature, including the egg plant, capsicums and aloes.

Not only was Constable purchasing plants from local and national suppliers in quantity, he also offered his own collections to others, suggesting that his gardener was proficient in propagating and cultivating enough to share. A letter from a 'P. Johnson' of York on the 20th April 1766 reads:

> "I am most sincerely thankful, Dear Sir, for your kind offer of Shrubs or Greenhouse plants…But my humble Garden, 'tho big enough for its Owner is for a Town House, will not bear to be Crowded, and admits of no more shrubs than that grow in three little Clumps upon a slope, so are easily supplied at home". (ERRO DDCC/145/5, 1766)

This sharing of specimens was not an isolated occurrence. Others close to Constable, including his half-brother Marmaduke Tunstall, were keen to both send and receive plants. The Burton Constable archive contains three letters from Joseph Shepherd, a friend of Constable's in Spain, to Marmaduke Tunstall from the late 1770s. which document the exchange of plants and seeds between the two parties. Shepherd wrote of sending oaks and a plant "only curious for riseing to a great size", and then noted,

> "In one word if I can get any thing else I will send it you by some of own that are comeing and will employ my friends in Murcia and Valencia to serve you with seeds but as you will be much better versed in them Than I, if you would send me a list, I promise to procure and send them if I can get them in our peninsula." (ERRO DDCC/144/11, 1777).

The relationship was reciprocal, Shepherd then requested plants from Tunstall, including anemone, auriculas, tulips and crown imperials. Tunstall made notes on the letter around the requests between the lines of text indicating the possibility of this, including 'will send but dear', 'can send some of my own' and 'can send plants'. As the letter was in Constable's possession, this could indicate that Tunstall sent this to him to see what he also could provide. Tunstall then noted on the letter another list of plants without a context, but based on subsequent letters from Shepherd seem to be a request list. These include,

> "Rhododendron Ponticum found near Gibraltar the most beautiful shrub known… Also seeds of most sorts of flowers, both natives especially + those introduced from Mexico, Peru, Chily, common things not to be neglected, perhaps scarce here" (Tunstall, 1777).

Shepherd wrote back in a letter of 1778 from Valladolid in Spain saying he would send everything except the *Rhododendron ponticum*. He also noted,

> "As for Oderiferous Garden Shrubs, and flowers, I cannot promise you any, Gardens here of any kind are so rare that from twenty to twenty leagues you will not find as good a Garden as in any common Farmers house in England, and even the Kings Gardens are so poor that I do not remember to have seen any one curious thing in them" (ERRO DDCC/144/11, c. 1778).

A further letter in 1781 recorded the fate of the plants Tunstall sent to Shepherd after his request in 1777,

> "The Flowers and plants you was so kind as to send us do very finely excepting the Fritilary which notwithstand all our care dwindles sadly. The Polyanthus have propaged very mutch and are very beautiful, and I hope the Auriculas will do the same as they promise fairly: and the double violets are become numerous. The daisies were dead" (ERRO DDCC/144/11, 1781).

This series of correspondence confirms that as well as his own contacts abroad, Constable's kinsmen were also collecting plants and sharing them in their turn. The plants were being collected for their beauty, rarity and curiosity and it seems that Tunstall was keen to acquire those which may be coming into Spain from South America. There was a drive to own and cultivate a wide spectrum of the plant world, and Constable was certainly part of the global plant network. The volume of exotics and curious specimens purchased by Constable lessened considerably after the late 1760s and the relocation of the stove. The vouchers do indicate, however, that Constable maintained a general, if not so passionate, horticultural interest throughout his life, evidenced by continued plant purchases and the large number of 'diverse' trees purchased for the landscape in 1779, as detailed in chapter three.

With such a plethora of curious and exotic plants being grown at Burton Constable, an owner focussed on only the curious and exotic may have neglected the native plants of the region. William Constable, however, was also interested in the local plants which were commonplace in the surrounding countryside. Whilst he sought out and invested time and money in a wealth of exotics, he also made space for native plant collections. His *hortus siccus* contains a large number of native plants in his quest for a complete classification, which was not unusual and will be discussed further in chapter seven. Of particular note, however, is the record of him cultivating these plants within his stove garden for study and collection. The only record for this is a notebook entitled 'A catalogue of Plants upon the north Border in the Stove Garden' which was recorded by Elisabeth Hall in 1986 (Hall, 1986, p. 13) and has been subsequently lost.[17] She notes the recording of a 'North Border' within the walls of the stove garden at Burton, the catalogue listing and numbering more than five hundred plants. The notebook is said to mark plants as to whether they were positioned 'near the Garden house' or whether they were found in Holderness. Some near the garden house were introductions, but she notes that the others were "mainly native". Hall (1995, p. 145) goes so far as to call part of the outside collections a 'botanic garden'. This area may fall under Laird's (1999) concept of the flower garden as an area set aside for choice or curious plants, although it was certainly more specialist than many of the period. The choice to cultivate natives and to number the plants in the ground set it out more accurately as Hall suggests as a small botanical garden, with an aim to collect, cultivate and classify. Within Laird's (ibid.) flower garden, Constable represents the botanical end of the scale, creating a distinct area with walls and a stove where plants were classified and collected in a similar nature to a cabinet of curiosity.

The surviving evidence for the Burton Constable living plant collections indicate a vibrant and varied horticultural approach. Plants were purchased in bulk to enhance the wider landscape and to create floral displays, in addition to individual specimens cultivated for interest and curiosity. The scale of the stove and stove garden including their botanically curated collections make clear that Constable was a consummate plantsman. Interest was sparked not only by the strange and the new, but also by the economically and scientifically significant. Indeed, the presence of native plants, arranged and labelled within the stove garden clearly sets a classificatory motive for the living collections in Constable's care. Here, there was more to the garden than the impressive, beautiful and wonderful.

It is probable that the extent of living collections within eighteenth-century gardens was far greater than is now realised due to their ephemeral nature and their propensity to be overlooked in the quantification of collections. The evidence can be difficult to extract and is

[17] The notebook is unfortunately among the items which are now missing from the archive.

often piecemeal, but if carefully considered may provide an alternative perspective on the cultivation efforts of a significant segment of the eighteenth-century gentry. The evidence of living collections at Burton Constable and the additional case studies above provides an emerging and vibrant picture of aesthetic, botanical and scholarly approaches to the assemblage of living plant specimens which was by no means limited to these individuals.

The fragmentary pieces of information, whilst easily passed over in isolation, combine to form a picture of widespread plant collecting in the eighteenth century, and point to the fact that it was a more broadly employed practice than is often acknowledged. In many gardens, significant investment of skill and resources, in addition to the application of the latest technology, was expended on establishing and maintaining an eclectic assemblage of plants with a variety of purposes. The evidence suggests an extensive fashion among the professional and gentry class of creating collections within a landscape, but also within specialist areas of the garden, such as the hot house, and 'botanical' garden. It is not suggested that this was the practice in all eighteenth-century gardens, however, it is probable that there are further examples of botanically inclined gardens which may contribute to this strand of research in the future. The activity was certainly widespread enough to fuel a thriving merchant and nursery trade in specialist plants, and the continued development of and investment in expensive growing technology in the form of stoves and greenhouses.

While these living collections can be identified and often quantified, their dedicated purpose is often less clear, as is any return they provided to the keeper for all of his or her money, effort and time. Botanical, scientific, aesthetic and social motivations will be explored in the coming chapters, but how were these areas enjoyed or shown off? This aspect of plant collection has rarely been debated. The visiting and enjoyment of parkland has been discussed to a limited extent in the well-developed sphere of historical landscape design, but plant assemblages receive short shrift in this discussion. The landscape would indeed have been impressive and was convenient to enjoy by foot or carriage, but as a locus of investment and spectacle, the stove or hot house must have been a well-visited location of considerable significance. Evidence is piecemeal for visits, and a further and thorough dedicated study of this aspect of stove growing is an area in need of further research.

The collection of plants in the eighteenth century can be seen to be a widespread practice, which its advocates practiced with gusto. Certainly, exotics were present in the landscape for curiosity and aesthetic value, however the cultivation of plants as single specimens within areas designed for the purpose forces an alternative reading. Plants were being cultivated as artefacts, for curiosity and classification, in the gardens of gentlemen and professionals alike. Indeed, the preface of John Hill's (1757, p. 1) *Eden* stated that one of the book's goals was to "unite the Science of Botany to the Arts of Culture: to apply Philosophy to Gardening; and make

it raise those Scenes wherein it takes Delight". Clearly the garden was increasingly drawing on wider cultural developments and philosophical ideals, and it is those which will be discussed in the next chapter.

CHAPTER 5: KNOWLEDGE, BOTANY AND NATURAL PHILOSOPHY

The excitement surrounding new plant introductions and the possibilities they held was embodied in a vast array of collections, displays and garden settings. Underlying the physicality of the new arrivals was a rich seam of scientific and philosophical thought which transformed the way people thought about the world, themselves and their plant collections. The period covered by this study comes immediately after the prolific age of discovery of the early modern period, a time of expanding worlds, increase in access to publications and advancing philosophies (Park & Daston, 2008, p. 1). Study of the natural world including geology, insects, marine life and animals escalated, in part due to advances in technologies like microscopy. Plants were one of the most direct and accessible ways in which the unfolding of the known world could be understood through the new rational epistemology of the Enlightenment. Despite the fact that the new trend for scholarship and collection of plants did not happen in isolation, a wider contextual narrative of science and knowledge is rarely present in modern garden studies. Major scientific and epistemological advances in the seventeenth century did not just influence how plants were studied in this and coming centuries, they were the catalyst for the investigations and the philosophical basis of their understanding.

In a bid to further understand the world, natural philosophers followed the Baconian model of inductive reasoning, enthused by the successes of Newton and stimulated by the new publications, experimental methods, and fresh objects for study. Many of these key works were to be found in country house libraries of the period, providing access to the latest methods and ideas. But books were not the only method by which the scientific word spread. The period saw the popularisation of the concepts of early scientific thought and process through societies, social networks, the establishment of the museum as a visitor attraction and the rise of amateur discovery and experiment. The fascination with plants was not limited to the garden arena, so this chapter will widen the perspective of study to consider the intellectual context in which their collections existed.

A brief context of the cultures of science and knowledge will be discussed, then evidence presented from Burton Constable to demonstrate that plant collection and the intellectual endeavours of natural history were inextricably linked to the use of the garden. The collections arising from this tradition will be discussed in chapter six, and herbariums, or the *hortus siccus*, as a collector concept, deserve particular analysis, and will be discussed in detail in chapter seven. The three chapters together will provide an intellectual and social context for the

collection and cultivation of plants in the eighteenth century. Whilst informative in itself, the study of scientifically-based collections also provides a new frame of reference for the garden-based collections discussed in earlier chapters.

THE CONTEXT OF KNOWLEDGE: BACON TO NEWTON

The history of science in the eighteenth century is commonly seen as a time of consolidation and assimilation (Porter, 2003, pp. 2-3). It follows the dramatic developments and discoveries of the sixteenth- and seventeenth-century's 'scientific revolution' forged by Kepler (1571-1630), Galileo (1564-1642), Descartes (1596-1650) and Leibniz (1646-1716), followed by the decisive discoveries of Newton (Reill, 2003, p. 23). The science of the eighteenth century has often been considered with less enthusiasm than its flanking centuries, which both brought dramatic discoveries and innovation to the study of scientific disciplines. However, Jacob (1988) argues that the Enlightenment was significant as the time at which scientific knowledge became an integral part of western culture.

The natural philosophers of the century continued to make progress and to advance knowledge (Porter, 2003, p. 6), while their discoveries were becoming ever more accessible and of interest to wider cultural groups. The eighteenth century was not one of great scientific innovation to rival the seismic shifts of the seventeenth and nineteenth centuries, but was the period in which science became part of the European psyche, eclipsed religion and superstition as the benchmark of understanding, and more importantly to this discussion, became accessible to the literate and more widely adopted into the psyche and culture of the elite. This created a culture in which science was a fashionable and prestigious pursuit in which to engage, one popular area being the discovery and classification of plant species. The methods employed in these activities stemmed from the work of seventeenth-century philosophers, the most influential to the scientific process being Sir Francis Bacon (1561-1626).

In the early seventeenth century, Bacon initiated a new epistemological philosophy which was to revolutionise scientific method. Baconianism questioned the received authority of Aristotlelian scholasticism, the dominant philosophy of academic study in the western world at the time (Judd, 2011, p. 8), and its reliance on the presumptive authority of the past. He also rejected the place of religion and church dogma in scientific enquiry and emphasised the importance of experiment (ibid., p. 34). Bacon posited that new methods of understanding the world were required and published philosophies which would change the way in which an understanding of the world was pursued by scholars. His ideas were shaped by a dislike of the decadence and ostentatious collecting by the court, and the view that a narrower and more systematic discipline might produce histories with deeper significance (Arnold, 2006, p. 20).

Bacon thus directly affected approaches to knowledge and natural philosophy in the coming centuries.

Novum Organum (Bacon, 2000) or the New Organon, set down Bacon's methods and objectives for the production of new understandings of the world. Russell (1986, p. 497) states that Bacon "has permanent importance as the founder of modern inductive method and [is] the pioneer in the attempt at logical systematization of scientific procedure". Bacon explained in the *New Organon* that,

> "My method, though hard to practise, is easy to explain; and it is this. I propose to establish progressive stages of certainty. The evidence of the sense, helped and guarded by a certain process of correction, I retain. But the mental operation which follows the act of sense I for the most part reject; and instead of it I open and lay out a new and certain path for the mind to proceed in, starting directly from the simple sensuous perception" (Bacon, 2000, p. 40).

Bacon saw natural history as data which could reveal truth through a process of induction and experimentation (Swann, 2001, p. 60). The major features of his philosophy relevant to this study are this emphasis on inductive reasoning based on observation of the world, and the importance attributed to method, rather than genius, in the production of knowledge. Both directly affected the way scholars approached the study of natural history and philosophy, and therefore plants, in the eighteenth century.

Many later thinkers were influenced by Bacon, his philosophies impacting on future theories of knowledge such as those of John Locke and Isaac Newton. Locke emphasised the role of observation and experiment in the understanding of natural philosophical systems (Anstey, 2011, pp. 221-223), and was an influential member of the Royal Society. He also held his own plant and seed collection, including a *hortus siccus* (Harris & Anstey, 2009). Other mechanical philosophers such as Robert Boyle (1627-1691) and Robert Hooke (1635-1703) supported the new experimental method and precise recording of phenomena (Blair, 2006, p. 400). Newton's mathematical achievements helped to popularise the study of mechanics as a physical science in the eighteenth century (Turner, 1967, p. 218).

Major discoveries based on this new methodology of observation and experiment, such as those of Kepler in the laws of planetary motions (Blair, 2006, p. 401) and those of Newton who introduced an approach based on mathematical principles, instigated momentous change in the scientific community. The successes, possibilities and opportunities emerging from the new science were plain to see and by the beginning of the eighteenth century the traditional, Aristotelian outlook had yielded almost completely to the new mechanical and mathematised

natural philosophies (ibid., pp. 365-366). The new philosophy spread widely, assisted by new methods of printing.

The printed word had influenced the intellectual world for many years, but it was in the eighteenth century that books became a commodity for mass consumption (Blanning, 2002, p. 133). The quantity and availability of books led to a change in the readers of books and the way they read. People read more and digested wider texts, assisted by the eighteenth-century's replacement of Latin by English as the common language of the printed word (ibid., pp. 138-140). The sale of periodicals rose, associated with and supported by the rise of the popular coffee house culture (ibid., p. 159) to be discussed later in the chapter.

The discoveries of the seventeenth century, including those of Newton, were based on the methodological approach of Bacon and created a seismic shift in knowledge making. An empirical approach[18], together with rational analysis had produced an understanding of the world that had not previously been considered or achieved. The optimism stemming from the great scientific shifts of the seventeenth century continued to influence science and culture in the eighteenth century, including natural history, natural philosophy, plant collections, their collectors and the *virtuosi*.

NATURAL PHILOSOPHY AND NATURAL HISTORY

During the early modern period, natural history was the primary locus of scientific thought (Swann, 2001, p. 57). In the eighteenth century its study became increasingly scientifically driven and it was thought central to an understanding of the world, so the term 'natural philosophy' became more widely used. Many philosophical stances, including the initial catalysts of Bacon and Descartes, emphasised the importance of the study of the natural world in the pursuit of truth. For the purposes of this discussion, natural philosophy will be defined as the study of the natural physical properties of the universe, and natural history as the research and study of natural organisms, both within their environment and removed from it. An engagement in natural philosophy was a mainstay of enlightenment thinking and the natural sciences were a significant area in which new definitions of knowledge arose from the new method (Findlen, 2006, p. 435). Recent histories of knowledge have greatly improved our understanding of the development of science and natural philosophy in the Enlightenment (see

[18] The term empirical, and the label of empiricist were not complimentary terms for much of the early modern period, being associated with non-licenced healers of both sexes (Hanson, 2009, p. 9). The term is used in this study in its modern understanding of a practice based on verifiable experience, rather than theory or logic.

for example Clark *et. al.* (1999), and Jardine et. al. (1996), providing an established context for a discussion of the place of plants).

Fissell and Cooter (2003, p. 130) note that the term 'scientist' had not been coined in the eighteenth century, nevertheless, the terms 'science' and 'natural philosophy' are used by modern scholars somewhat interchangeably in discussion of the phenomenon. Natural philosophy was the term used to denote any study of the natural sciences, with subdivisions of botany, zoology and geology not being identified until later in the century (Gascoigne, 2003, p. 286). The term 'experimental philosophy' was also increasingly used throughout the eighteenth century to describe areas of natural philosophy such as electricity, magnetism and optics which leant themselves readily to investigation by practical experimentation (ibid., p. 303).

The popularity of new material to study and the optimism which accompanied the new method made natural philosophy and natural history ever more popular. Travellers throughout the world provided accounts of new phenomena to observe and increasing volumes of artefacts to study (Findlen, 2006, p. 435). Park and Daston (2008, p. 14) have identified the new trade markets and resultant influx of commodities as the most significant driver in the development of natural history as a discipline. The sudden increase in popularity and accessibility of naturalia meant that the study of natural history and natural philosophy was not restricted to university environments.

The natural sciences struggled to make headway in the traditional university system during the late seventeenth century, which still focussed on training for the clergy (Porter, 2003, p. 8). Counter to this, scientific academies with Royal endorsement began to emerge across Europe, including The Royal Society in London in 1662 and the French Académie Royale des Sciences in 1666 (Porter, 2003, p. 8). These societies revolutionised the scientific world, creating a membership for interested parties and the scientific journal as a timely, accessible and trusted form of communication (McClellan, 2003, p. 90). The Royal Society and other institutions throughout Europe were therefore integral in disseminating information and facilitating the assimilation of science with western culture. Their basis in the new science embraced Baconian observation, experimentation and empiricism (Hanson, 2009, p. 9), providing a platform and encouragement for those who would engage in the new systematic methods of the advancement of knowledge in natural philosophy.

Election to the Royal Society was automatic for aristocrats (Sorrenson, 1996, p. 33), but membership was not limited to the elite. The largest proportion of members of these societies came from the upper classes, although the middle ranks were also admitted (ibid.), immediately making science more democratic and enabling social links and mobility. It was

fashionable to be part of the Royal Society, and many aristocrats and gentry who made little practical contribution to science were Fellows, including William Constable. Sorrenson notes,

> "while many Fellows expected much from the Society as a whole, they often had more modest ambitions for themselves. They saw themselves as patrons and sometime observers rather than as regular practitioners of science; they meant to do no more than pay their dues, read the Society's journal… and occasionally attend meetings or correspond with the Society, which they expected in turn to provide them with informative, entertaining, enlightening and useful knowledge" (Sorrenson, 1996, p. 33)

This description fits William Constable well and his contribution will be discussed further below. The membership of the society grew from 131 in 1700 to 531 in 1800 (ibid., p. 30). By the end of the century the popularity of the natural sciences had grown to such an extent that further professional societies were founded , including the Society for the Investigation of Natural History in 1782, the Botanical Society of Lichfield in 1785 and the Linnaean Society in 1788 (Laird, 2015, p. 334).

Within this vast sphere of learning, discovering and sharing the knowledge of natural philosophy, demand developed for what Porter (2003, p. 9) calls a "marketplace in ideas". Learned aristocrats held vast libraries of knowledge and sought the council of other intellectuals. Public and private scientific demonstrations, the practical exhibition and application of ideas, became increasingly sought and were a popular pastime of the aristocracy (Turner, 2003, p. 515). Demonstrations led to a desire for many to own apparatus for themselves, and many aristocrats held private collections of wide ranges of scientific equipment, including cranes, pumps and engines (ibid., p. 516), those of William Constable and John Stuart, third Earl of Bute will be discussed below. The popularisation of the study of natural philosophy was in part a realisation of the possibility of scientific endeavour, in part a transformation of the tradition of curiosity from the seventeenth century, and in part a reaction to the new world, and the wonders it offered.

BOTANY

> "The handmaid to [Materia Medica] is Botany, a department of natural history, which affords the greatest instruction and recreation with the least exercise of the mind" (Lettsom, 1786).

As this quote from Dr. Fothergill's memoir by Lettsom suggests, botany was very much a part of natural history, and considered by some to be one of the most accessible and easily understood. Allen identified botany as one of the first sciences to make social headway in the

popular study of natural history. It had practical applications for medicine, could be carried out "without incurring excessive embarrassment or attracting much suspicion", and was bolstered by the plant trade (Allen, 1976, pp. 4-5). Botanists were at the forefront of the transition to observation as a mode of study of the natural world (Findlen, 2006, p. 442); the Baconian principles of knowledge derivation from process, method and study had obvious connotations for the systematic collection and classification of objects. Easterby-Smith (2018) has successfully demonstrated how plant traders fed this enlightenment-based culture of commerce and connoisseurship, and contributed to framing the science of botany as a cultural pursuit.

The late-seventeenth century saw a great interest in botany, and subsequently many advances in knowledge. In his 1790 work *Historical and biographical sketches of the progress of botany in England*, Pulteney (1790, p. 66) called the period the "Golden Age of Botany". He credited Morison (1620-1683), Ray (1627-1705), Herman (1646-1695), Tournefort (1656-1708) and Rivinus (1652-1723) with improvements to taxonomic systems, and Rhede[19] (1636-1691), Rumphius (1627-1702), Plumier (1646-1704) and Sloane (1660-1753) with "great works in exotic botany" (Pulteney, 1790, p. 66). This success was due in part to vast increase in the availability of horticultural and botanical textbooks, and further enhanced by the growth of social conduits for scientific knowledge. These included the botanical 'club' which gathered at the Temple Coffee House near Fleet Street in London, which Laird (2015, p. 127) has identified as an informal group which helped to shape botanical science, plant collecting and the nursery trade.

In the early-eighteenth century the most commonly used taxonomic systems of botany were those of Tournefort and Ray (Campbell-Culver, 2001, p. 122). That is, before Carl Linnaeus published *Fundamenta Botanica* in 1736, and *Hortus Cliffortianus* and *Genera Plantarum* in 1737, books that still form the basis of the natural classification system in use today. Linnaeus later built on this work in his 1751 *Philosophia Botanica* and *Species Plantarum* in 1753, which extended the system (Freer, 2005, p. ix). Linnaeus' taxonomic theories relating to plants were simple; the class of a plant could be determined by counting the stamens, or male reproductive parts of a flower, and the order could be determined by counting the pistils, or female parts of a flower (Huxley, 2007, p. 135).The binomial system, a new form of nomenclature set out in *Species Plantarum*, further eased the identification and classification of plant specimens. Ultimately, Linnaeus' became the agreed and most widely used system providing professionals and amateurs alike with an accessible system of classification which could be applied to their collections.

[19] The Dutch Governor of Malabar who commissioned *Hortus Indicus Malabaricus* (Calmann, 1977, p. 16), a treatise documenting the medicinal plants of parts of India.

Reflecting trends in wider natural philosophy, botany saw an upsurge in popularity. A letter from John Ellis in *Philosophical Transactions* noted, "as the spirit of planting has increased in this kingdom, the study of botany has become more fashionable; the works of the celebrated Linnaeus, hereforeto looked on as capracious and strange, are now in the hands of every man, who wishes to study the order of nature" (Ellis, 1761, p. 929). Further publications encouraged the burgeoning trend. Philip Miller's *Gardener's Dictionary* published in successive editions from 1731 to 1768 provided not just an overview of garden workings and the ornamental values of plants, but also the rudiments of horticultural science (Elliott, 2011, p. 3). He adopted the systems of Linnaeus from 1759 (Saunders, 1995, p. 89) confirming its dominance as the primary method of botanical classification.

While systematic botany and the classification of the full breadth of known plants captivated botanists and interested amateurs of the time, attention was also given to plants of curiosity, to further understand those which exhibited unusual characteristics, in particular, movement. Rapid, nastic movements in plants would intrigue and confuse contemplators of natural philosophy and science until well into the nineteenth century, when Darwin even proposed that plants may have brain-like structures which enabled this movement to take effect (Whippo & Hangarter, 2009, p. 2115) . A letter from John Hill to Linneaus, published as a pamphlet in 1762, attempted to explain the phenomenon alongside the 'sleep' of plants, correctly correlating these to environmental conditions and the native climate of the plant's geographical range (Hill, 1762). This particular fascination is well reflected in plant collections, as discussed in chapter four.

It can be seen that in addition to their ornamental uses, plants held vast scientific value in the eighteenth century, however, the fields of horticulture as a study of cultivation practices, and botany as the scientific study of plants were not well-defined. Clearly the two often operated in isolation from each other, but where they overlapped there was not a distinct demarcation in study and practice. Nevertheless, by the end of the eighteenth century the joint study of these disciplines and the study of natural philosophy had blossomed into a serious but popular academic endeavour. The philosophies of the seventeenth century had set the terms of the discussion which benefitted from the patronage of several spheres of society thanks to publication and egalitarian society membership. A solid economic and social basis was formed, on which the advancement of knowledge could grow. The study of the natural world became a popular pastime, and plants were central to this trend. A number of allied fields relating to the societal context of this intellectual development are relevant to this discussion and so are noted here for their relevance, particularly religion, wonder and curiosity, and the class divide.

SOCIETAL CONTEXT

RELIGION

The role of religion is pertinent to any discussion of scientific thought in the eighteenth century. Natural philosophy covered a wider field than our current understanding of science, and religion was a part of that study. Distinctions were blurred and discussions were often nationally and politically charged (Brooke, 2003, pp. 744-748). An individual could comfortably engage in both whilst being assured of their faith, practitioners were happy that they were discovering the glory of god and his work, not disproving his existence. Newton, as a practitioner of natural philosopher, was confident that he was exposing the laws of a single deity (Brooke, 2003, p. 744) and Hans Sloane became a subscribing member of the Society for Promoting Christian Knowledge in 1734 (Society for Promoting Christian Knowledge, 1746, p. 18). It is true, however, that understandings of religion and natural philosophy changed many times over the seventeenth, eighteenth, and nineteenth centuries. Discoveries in the seventeenth century necessitated the "separation" of the sciences from religious control (Brooke, 2003, p. 741), and the development of conclusions that followed required several shifts of worldview which were not always comfortable or eagerly received.

Various views circulated among the religious and scientific communities, with deism becoming a more common belief structure in the late-seventeenth and early-eighteenth centuries. This view held that a supreme being, or god, was responsible for imposing the original universal laws of nature on the world, but did not intervene in these laws or their implementation day to day (Grayling, 2008, p. xi). Many found this difficult to accept, and there was conflict between the church and those advancing new theories. For many natural philosophers, however, they were purely engaged in discovering the wisdom of god in the structures and wonders he had created (Brooke, 2003, p. 742). Feldhay (2006) concludes that religious order and scientific authority were mutually dependent on one another within a period of unprecedented transformation for both (ibid., p. 755). We should therefore consider religion as a concept readily reconciled with scientific study during this period, within the process of developing ideas and shifting ideologies.

WONDER AND CURIOSITY

It was stated above that the popularisation of natural philosophy was due to a combination of the possibilities of scientific endeavour, a transformation of the seventeenth-century curiosity tradition and the wonders offered by the new world. The concepts of wonder and curiosity continued to hold resonance in the eighteenth-century mind, and had social significance of their own, therefore should be considered alongside science in the context of collection. From the sixteenth century, the exploration of new lands had opened up worlds and possibilities previously unforeseen by the scientific community of Britain. The study of these, in addition to the rapid scientific developments of the sixteenth and seventeenth centuries, elicited developing reactions from the scientific community, *virtuosi*, and eventually, the greater British population. The perception of and reaction to new information affords an excellent insight into the motivations of the discoverer, the experimenter, the natural historian and the collector. Whether an object is seen purely for its novelty value, or is considered an object for scholarship shapes its interpretation, and how it is received and exploited in society. The concepts of wonder and curiosity are discussed variously by Daston and Park (2001), Campbell (1999) and Evans and Marr (2006) and can inform the investigation of plants and botanical science, most specifically, the collection of exotics, which was borne of curiosity, and sparked wonder in the minds of its protagonists.

Despite comprehensive discussion of the concept of wonder and curiosity these terms defy definition. Marr (2006, p. 2), has addressed the issue, and highlighted the problematic nature of the semantics of both, the change in the perception of each throughout the Renaissance and Enlightenment, and the entanglement of one with the other. For the purposes of this discussion of the late-seventeenth and early-eighteenth centuries, wonder may be seen as the amazement at the unfamiliar or beautiful, and curiosity as the desire to know, learn or obtain. Thus, wonder and curiosity are defined as discreet phenomena, and a study should be mindful not to assimilate them as one.

In the same way that wonder and curiosity were differentiated but linked, neither were natural philosophy and wonder discreet concepts; the fictional quality of many intended scientific writings was based on the rhetoric of wonder. Robert Hooke's *Micrographia*, for example, appealed to the senses and reported its findings with a narrative, appealing to the emotions and wonder of the reader (Campbell, 1999, pp. 184-189). Despite Hooke's intention to return the science of nature to "the plainness and soundness of Observations on material and obvious things" (Hooke, 1667, p. preface), also noted that, "I do not on only propose this kind of *Experimental Philosophy* as a matter of high *rapture* and *delight* of the mind, but even as a *material* and *sensible Pleasure"* (ibid.). Wonder then, in the late-seventeenth century, was still bound up with scientific endeavour, and was an acceptable expression in sensible scientific discourse.

The metamorphosis of wonder is charted in the cultural sphere from the high medieval to the early-eighteenth century. Though prevalent in late-seventeenth century scientific thought, it had become distasteful by the mid-eighteenth century and came to be considered as vulgar. Simultaneously, the tradition of curiosity became less bound up in the lust and pride of the early seventeenth century, transitioned through greed and avarice to become more respectable in the late century, and eventually became the "badge of the disinterested and dedicated naturalist" by the mid-eighteenth century (Daston & Park, 2001, p. 304). Thus curiosity (and for the purposes of this discussion, collecting) became the operational arm of scientific endeavour, and wonder was transitioned to entertainment. Theology maintained a place in this philosophy, most authors of the eighteenth century glorifying the agency of God in the creation of their curiosities and scientific subjects (ibid., p. 324).

The shift in focus from wonder to curiosity, Campbell observes, was predicated on a newly stabilised world-view, in which the threat of the new appeared less, and the concept of wonder remained in public demonstrations and spectacle (Campbell, 1999, pp. 7-9). This often-overlooked phenomenon of popular science and entertainment does feature plants as theatrical agents and is recommended as an avenue for further study, the scope of this thesis not being large enough to encompass it. Although the perception of threat decreased in the eighteenth century, and wonder became vulgar, the curiosity remained. Marr notes that "while wonders had become the stuff of satire in late-seventeenth-century England… this did not mark the end of their currency in other times, places and discourses" (Marr, 2006, p. 8). The established fashion of collecting as a means to order nature and wonder at its marvels developed into a desire to investigate and understand. Exotics were still prized as objects for study, classification and comparison. It would be naïve to assume that a little wonder did not still feature in the psyches of those encountering new and spectacular species for the first time.

STRUCTURE OF SCIENTIFIC ENDEAVOUR

The discussion above demonstrates that the eighteenth-century study of plants sits within a scientific period of significant complexity and momentum. Although the notion of the professional scientist was not in existence in the eighteenth century, there was a degree of rigour brought about by those like medics who practiced method through their work, the increasing popularisation of science and its transition into a fashionable commodity. Botanical gardens throughout the world collected and categorised plants for the advancement of empire, items were collected for profit and nature became a global commodity (Findlen, 2006, p. 467). Certainly, many devoted their lives to the study of science, particularly botany, and it is these individuals most commonly thought of as the serious contributors of the day. Nevertheless, many others, often of the gentry class, devoted themselves to the study of natural philosophy to varying degrees. Some made discoveries and built knowledge akin to their professional

counterparts, others engaged purely for entertainment and social gain. Artefacts of natural history and the knowledge inherent within them became a currency of social interaction.

Eighteenth-century society in England was a status not class hierarchy, and social status was largely determined at birth (Heyck, 2013, p. 48). The nobility and the gentry, that is the titular and larger landlords, amounted to just three percent of the population, but received fifteen percent of national income (ibid., p. 49). The status of 'gentleman' was enjoyed by all in both of these ranks, and is defined by Heyck as, "the ability to live well without working for a living" (ibid.). Below the gentry, but above the artisan class of tradesmen and craftspeople, came the merchants and professionals. Professional status was afforded to the clergy, lawyers and doctors (ibid., p. 50). At the beginning of the eighteenth-century professional men were not regarded as genteel, however as the century wore on they were able to gain considerable respectability and were even thought of as satellites of the landed orders (ibid.).

It is from these two sections of society that the main protagonists of natural history in the eighteenth century emerged[20]. Physicians, clergymen who were often second sons of the gentry, and others of a professional class came into contact with objects and plants through their work and became interested in pursuing their knowledge further. Some, including Richard Richardson, physician and botanist (Courtenay, 2004), John Lightfoot (1735-1788), clergyman and botanist (Bowden, 2004) and John Fothergill, physician and naturalist, later became known for their work in natural history. Those from the gentlemanly class had the time and wealth necessary for patronage, innovation, membership of the Royal Society and further fashionable involvement in the collection and study of all aspects of natural history. Swann (2001, p. 77) has argued that seventeenth-century social and political developments had led to an increase in numbers of the gentry class with time on their hands, and that scholarship was an activity by which they could both occupy their time and gain status. These participants were often referred to as 'gentleman amateurs', but indeed many rivalled the professional class in knowledge and many were women. This concept will be discussed further in relation to botanical networks later in the chapter.

Professionals and the gentry alike were welcome in the Royal Society and to the coffee houses of the eighteenth century. Coffee houses had become, "ubiquitous features of the modern urban landscape, indispensable centres for socialising, for news and gossip, and for discussion and debate" (Ellis, 2011). In London in 1714, there were around 2,000 coffee houses in which one could choose to mix with others of similar inclinations and interests (Baird, 2014, p. 17). Polite society involving the gentry and professionals was a significant arena in the pursuit of new knowledge and has already been discussed in the context of garden making by Williamson

[20] By contrast, the practical implementation of their discoveries which formed the basis of the industrial revolution was effected predominantly by the artisans and entrepreneurs (McClellan, 2003, p. 104).

(1995, p. 17). Many coffee houses subscribed to educational periodicals and made them available for patrons (Blanning, 2002, p. 160), establishing a culture of learning and an informal space for scholarship. Scientific seminars and political debate were a central activity, breaching social boundaries and enabling all to come together in a situation which favoured learning, the expansion of knowledge, and the dissemination of new ideas.

Baird (2014, p. 16) identifies a culture of increasing egalitarianism, tolerance and democracy, allowing participation in discussion from wider social groups, and identifies the coffee houses, clubs, societies and literary salons as devices which divided the public into more ideologically cohesive social groups. She particularly notes the social nature of these interactions, and the political affiliations which were a natural product of debate and choice. Furthering the argument, Easterby-Smith (2018, pp. 15-16) has discussed how social connections and financial resources were significant influences on one's position in the scholarly hierarchy, and how those who aimed to engage with the elite increasingly adopted 'polite' methods of interaction and sociability. Far from being simply a reflection of sociable life in eighteenth-century London, the intellectualism forged within coffee houses produced a social behaviour and process of its own which implicitly structured the pursuit of natural-philosophical knowledge toward the end of the early-modern period (Coulton, 2011, p. 43). It is argued here that this new social behaviour centred around knowledge was particularly significant in the study of plants, given the mutual benefits gained by a relationship between a person of botanical knowledge, and an interested member of the gentry class with land and wealth, often known as a gentleman amateur or a *virtuoso*.

The notion of the *virtuoso* had spread from Italy to Britain in the early-seventeenth century to describe collectors of art and antiquities, but by the mid-century had expanded to include collectors of natural objects (Hanson, 2009, p. 4). The term became part of a cultural ideal that identified a self-styled elite, with the Baconian system, collecting and curiosity at its heart (Swann, 2001, p. 76). The *virtuoso* was, in part, identified by their collection of objects, and a gentleman's education was a way in which he could both occupy his time and gain status (ibid., p. 77). "Participation in *virtuoso* activities provided seventeenth-century English Gentlemen with a basis for interchanges with social equals and thus for the creation of a shared class identity" (ibid., p. 78) for which Baconianism was the justification. By the end of the century, however, the term had become increasingly derogatory, linked to the connotations of wonder discussed above, often associated with those obsessed with the curious and rare but divorced from a greater understanding of the world at large (ibid., pp. 4-5). The term, however, could still command respect in the correct context, and the Royal Society was the institutional base for the *virtuosi* of England[21] (Hanson, 2009, p. 5).

[21] For further history of the term and its connotations see Hanson (2009)

Hanson (2009, p. 8) has argued that the *virtuoso* was a polymath and had a positive influence on the culture of both arts and sciences together. However, not all of the elite with an interest in scholarship were designated with the term. The description 'amateur' was often used as a respectful title for a non-professional collector (Easterby-Smith, 2018, p. 80), of which there were a great number within Enlightenment networks. The terms '*virtuoso*' and 'amateur' are by no means well-defined, and are often used interchangeably. In his documentation of Sprat's history of the Royal Society, Wood (1980, p. 20), suggested that whilst collection was a unifying activity in which all Royal Society members could engage, even the gentlemen of more limited technical skills could still make a valuable contribution. This contribution was that their rural seats made excellent sites for the contemplation and observation of nature. Coulton (2011, p. 50) identifies the role of the coffee house interaction in this exchange, "namely a commitment to the collective improvement of natural knowledge, and the desire of individuals to signal and augment their public status and reputation through (for example) socialising with intellectual superiors, or patronising the researches of those of lower rank". The land and wealth requirements necessary for the collection of a wide variety of plant material should be considered as fundamental to this relationship. The *virtuosi*, whilst not often at the intellectual vanguard of scientific experiment, were often its enablers.

The ability to use their land and wealth to enable the cultivation of plants for study was one of the greatest ways in which the elite could contribute to the development of knowledge. In his *Historical and biographical sketches of the progress of botany in England,* Pulteney observed that,

> "...among the favourable circumstances which contributed to distinguish, or, I might say, helped to form, the Golden Age of Botany, before alluded to, was that growing taste for the cultivation of exotics, which sprung up among the great and opulent, after the happy return of internal peace by the Restoration" (Pulteney, 1790, p. 104).

The cultivation of exotics primarily reserved for the elite is identified as being a circumstance which helped to further the knowledge of, or at least the cause of, botany. Gentlemen could be scholars and collect scientifically, or they could collect fashionably, or more usually, enjoyed an indulgent middle ground. They could collect on a whim, or target their purchases to fill gaps in their collections. The notion that one was engaging in and investing the furthering of knowledge was a badge of status as much as the presence of flourishing plants in a hot house.

The drive for additional status and notoriety and the prestige which came from the cultivation of exotics, clearly assisted botanical knowledge and the development of the sphere. Pulteney identified gardens of particular note as being that of Mr. Evelyn at Sayes Court, the Royal Gardens at Hampton Court, The Duchess of Beaufort's collections at Badminton, Dr Uvedale of Enfield and those of Bishop Compton of London at Fulham Palace among others. He

observed that "many private gentlemen vied with each other, in these elegant and useful amusements" (Pulteney, 1790, p. 104), and that,

> "...the growing commerce of the nation, the more frequent intercourse with Holland, where immense collections from the Dutch colonies had been made, rendered these gratifications more easily attainable than before; and, from all these happy coincidences, science in general reaped great benefit" (ibid., p. 105).

The distinction between true botanists and enthusiastic amateurs was acknowledged by practitioners at the time. In a letter to Linnaeus, the merchant Peter Collinson noted,

> "You desire to know our botanical people. The first in rank is the Right Honourable the Earl of Bute, He is a perfect master of your methods. By His Letter to Mee you will see his sentiments and that of another Learned Botanist on yr. Sp. Plantarum.
>
> Then there is Mr Watson, Mr Ellis, Mr Ehret, Mr Miller, Docr. Willmer, Docr. Mitchel, Docr. Martyn. These all well Skill'd in your plan & there is others.
>
> But we hav great numbers of nobility and Gentry – that know plants very well, but yet don't make botanic science their peculiar study" (Collinson, 10th April 1755).

The point clearly made that plant collectors did so for differing intellectual ends.

The social distinctions described above mean that the structure of scientific advancement in England and throughout Europe was complex and fluid throughout the eighteenth century. From serious men of science to *virtuosi* and collectors of curios, definitions and distinctions are blurred. There is not a clear distinction between those who would study for amusement and spectacle, and those who would study for scientific ends. The gentry class held the professionals in high regard, and the professionals recognised the significant benefits that the wealth, land, time and enthusiasm could provide for the advancement of knowledge. William Curtis's unfinished *Flora Londinensis* which he worked on from 1774 to 1798 was made possible by the patronage of powerful and wealthy individuals, who also supported his creation of botanical gardens to aid physicians in their studies, the first of their kind (Clark, 2010). Due to a desire to be associated with knowledge development and science, the line between classes had been blurred, and both parties had found it advantageous. The professional class gained access to extensive collections, land and wealth, and the pastime of the gentry became a validated contribution to society within the new fashion for scientific development.

SPACES OF STUDY

As the trend for experiment and knowledge generation grew among the gentry, the nature and location of their scientific contribution developed. During the sixteenth and seventeenth centuries, anatomy theatres, cabinets of curiosity and botanical gardens had appeared as purpose-built spaces in which scholars could pursue knowledge of the natural world, reflecting the desire to place artefacts in a situation which allowed them to be empirically observed and analysed after the Baconian principle (Findlen, 2006, p. 273). Opitz, Bergwick and Van Tiggelen (2016) have suggested that these domestic and private spaces of gentlemen and gentlewomen, in addition to the middle and lower classes were also significant scientific arenas. In the late-seventeenth and eighteenth century, these domestic realms began to include dedicated scientific spaces including laboratories and botanical gardens in the homes of the elite. Zytaruk (2011, p. 15) has noted, for example, that the garden of John Evelyn at Sayes Court housed a chemical laboratory and that his garden was the site of frequent horticultural and design experiments.

Cooper (2006) has argued that despite modern distinctions of scientific and private space, the household was a crucial site of knowledge-making in early modern Europe. Her work identifies the study, or museum which involved collections as a central space of learning and investigation in the homes of the elite, in addition to further activities occurring in the workshop, kitchen and even on occasion, the dissection of cadavers in the bedroom (ibid., p. 226). Scientific method, experimentation and classification was happening in the homes of the elite and the *virtuosi*, and the garden was no exception. Plants were often central to this notion of scholarly domesticity, and were investigated as part of investigations into natural philosophy. In gardens, medicinal plants were cultivated and experiments were performed on the vegetable world (ibid., p. 227). The country estate was, in many cases, a locus of knowledge development.

Unfortunately, the science being performed in domestic circles and its associated spaces is not necessarily still visible. Those who engaged in a professional manner may have published their work or left other traces, while many less formal investigations may have been lost. Opitz, Bergwick and Van Tiggelen (2016, p. 3) highlight the "offstage" role that women played in this sphere, their contributions often going unrecorded due to the contemporary limitations of gender. Likewise, gender identities may be shaped by an involvement in the practice of a masculine science, but this is a discussion for another study. As botany was an occupation seen as appropriate for a seventeenth- and eighteenth-century lady, it was an avenue into science for many including the Duchess of Portland and the Duchess of Beaufort, both significant players in early modern cultivation and plant experiment. They, like many of their male and female contemporaries were early practitioners of, and facilitators of natural science. Their gardens were partly outdoor scientific spaces and botanical gardens.

SCIENCE AND THE BOTANICAL GARDEN

Private botanical spaces may have been modelled in part on the rapidly increasing botanical gardens of the colonial period. Botanical gardens played a significant role in the scientific community of Britain in the eighteenth century, so much so that McClellan (2003) considers them alongside academies, observatories, universities and Royal societies when discussing the organisation of science. By the end of the century, Europe alone possessed sixteen-hundred botanical gardens (McClellan, 2003, p. 101) with many more situated in colonies to study and collect the indigenous flora. Findlen (2006, p. 280) notes that as early as the sixteenth century, private botanical gardens had flourished not only as physic gardens for medicinal plants, but also as pleasure grounds of the elite, often around their own homes.

Many botanical gardens had begun as physic gardens in the sixteenth century, but this role diminished as the seventeenth and eighteenth centuries wore on (McClellan, 2003, p. 101). Like the Royal Societies, many botanical gardens were creations of, and supported by the state to further the science of botanical research (ibid.). Research was ongoing into the economic potential of plant specimens obtained as a result of continuing exploration and colonisation, although the fruits of this research were to be seen predominantly in the nineteenth century (Brockway, 1979). In the eighteenth century, the primary goal of these institutions was to study and classify the vegetable kingdom (McClellan, 2003, p. 102). This aim appealed to the consolidatory nature of science in this century and proffered a relatively simple model easily recreated by the landed gentry wishing to assimilate contemporary scientific methods for their own study and amusement.

While wealthy amateurs aimed to recreate scientific experiments at home as a form of enquiry and entertainment, so they readily adopted the idea of the botanical garden. The elite with their land and wealth could often surpass the formal botanical institutions in spectacle and scale. As seen in the previous chapter, many such as William Constable, the Duchess of Portland and the third Earl of Bute created living collections which borrowed the principles of order, universality and classification from botanical gardens, ordering and classifying the plants they grew in distinct parts of the garden in accordance with the new science, whilst maintaining show and display in others. In this sphere their involvement in the *Avant Garde* of scientific research could swell and innovate, perhaps more so than in other scientific genres which required specialist equipment. Most of the gentry had a gardener, who could be educated in the growth of ever more outlandish specimens via the books which were a feature of many libraries of the time. With land, the creation of stoves and investment in plants and skills, a garden owner had all the tools required to make a contribution to the furthering of knowledge.

KNOWLEDGE AND THE INDIVIDUAL

One of the earliest to demonstrate the application of a scientific process to plants in a domestic setting was the Duchess of Beaufort, Mary Capel Somerset (1630-1715). Whilst the scientific and philosophical influences which shaped the later knowledge-structures of plants were already in progress when she was building collections of live plants, dried collections and paintings at Badminton, the application of these to plant collections was relatively new. Munroe (2011, p. 111) has demonstrated how Somerset's work with plants blurred the line between gardening, horticulture and botany, considering the scientific alongside the curious and aesthetic. The developing link between science and plant collection shown by Somerset's collections later took hold among the gentry, as will be discussed further below.

Somerset lived in a time of pre-Linnaean classification, and the indexing of her surviving paintings and herbarium specimens reflects this. Naming systems used included Pliny, Dioscorides, Gerard, Parkinson, Tournefort, Bauhin and Clusius (Cottesloe, 1983, p. 19). Manuscripts exist in the Sloane manuscript library which carefully catalogued the plants growing in her Badminton gardens at the time (Chambers, 1997, p. 50). Her plants were recorded by consulting a variety of botanical authorities, both through books, professional networks and friendships, to aid accurate identification. Twenty-two different books are listed in connection with the catalogue of the garden, although this list does not include all the works referenced by Somerset in her catalogue (ibid., p. 58). Somerset was fastidious in her recording, and was frustrated by differences of opinion between authors, and by the confusion of using common names for exotic plants when they were sent from overseas (ibid., p. 57).

Schiebinger (2004, p. 60) has suggested that "Like many botanists of the time, the Duchess of Beaufort was interested in classification only insofar as it was useful for her to organize her gardens and catalogues", however, the scientific approach she took to her collections does not bear out this statement. The texts and approaches mentioned above suggest that Somerset valued information for the advantages it could bring to the advancement of natural philosophy. Her manuscripts contained a table of classes of different plant species, in addition to a list of Latin adjectives used in plant names to signify descriptive properties[22] (Laird, 2015, p. 88). Munroe's (2011, p. 112) access to the private collection of papers at Badminton has highlighted the scientific nature of Somerset's work with her plants. Her journal, Munroe notes, resembled those of the foremost natural philosophers of her day, detailing both the ongoing process and the products of her exacting cultivations. The careful notes, recording when a plant was pruned, items to further enquire into and instructions such as, "the biggest will blow the next yeer they must be kept under some pent house in the winter" (Mary Somerset, cited in Munroe, 2011, p. 113), Munroe classes as detailing a process of testing and hypothesis which we now recognise

[22] for example 'angustifolia' meaning ; with narrow leaves'.

as a scientific model. In addition to the horticultural information in the notebooks, Somerset's plant catalogues, which still exist in Sloane's manuscript collection, also contain information on propagation and germination requirements (Chambers, 1997, p. 51). Chambers (ibid.) suggests that this sets her apart from many contemporary male botanists, who he suggests were mainly interested in dried specimens and classification.

These records show not only that Somerset was approaching her collection and cultivation in a structured and scientific manner, but that she presumably hoped that her findings would be of benefit to others. Often she noted that she could not find her current plant subject in any of the books she possessed, and took particular care to document those in detail (Munroe, 2011, p. 116). Furthermore, she saw her own experiments as valid enough to question other published sources of the day in a number of comments made in letters, for example, "Pluk 185:1 Callameter or Milkwood in Pluk is Galactoxylon, this should have been amongst the trees" (Mary Somerset cited in Munroe, 2011, p. 117). Somerset clearly viewed herself as an equal to the authors of these sources, including the Royal Professor of Botany Leonard Plukenet (Munroe, 2011, p. 116). Indeed, her herbarium was used by naturalist John Ray in his efforts to incorporate exotic flora into a taxonomic system (McClain, 2001, p. 213).

Somerset exchanged both ideas and plants with Fellows of the Royal Society and other natural philosophers of the day, including Sir Hans Sloane, James Petiver, William Sherard and Jacob Bobart, demonstrating she was clearly part of the scientific circle (Munroe, 2011, pp. 113-114). Despite the contemporary disadvantage of being female, her wealth and situation offered significant advantages for the individuals who associated with her. The correspondence accessed by Munroe includes letters from Somerset to other members of the scientific community in which it is clear that she received seeds from them in order to experiment with and report back. One letter to Hans Sloane, thought to be from the late 1690s recorded,

> "I had indifferent good success wth the seeds you gave mee, severall of them have produced large plants w^{ch} I hope will prove trees, I cannot brag of the number that I have rais'd of those from the colledg[23], 2 of them are blowne, I have sent you one leake, to shew you the colour tho indeed it is too its prejudive being much more beautiful on the plant, the silke cotton thrives very well, & so does the Gourd but that do's not yet put out a flower" Mary Somerset cited in (Munroe, 2011, p. 114).

In addition to the physical investigation of plants and their classification, Somerset also held a significant library of scientific, horticultural and botanical works, both from the family library and ones she purchased from London booksellers (McClain, 2001, p. 122). She also borrowed

[23] Somerset regularly accepted seeds from Gresham College, the base of many of the Royal Society's activities (Munroe, 2011, p. 114).

from friends; Sloane regularly sent her copies of the Royal Society's *Transactions* (Munroe, 2011, p. 115). The process was clearly one of early science in relation to plants. Chambers notes that through the work of Somerset, "we can observe in action the very process of empiricism and abstraction that Locke outlined in the same decade in his *Essay on Human Understanding*" (Chambers, 1997, p. 59). As the scientific method developed, so did the relationship of later collectors with their plants, and the approach became increasingly empirical.

Another female horticultural pioneer, Margaret Cavendish Bentinck, the Duchess of Portland, was an avid collector and investigator. She devoted a large amount of time and investment to the study of natural history, building a zoo, aviary and gardens at her house in Bulstrode, Buckinghamshire (Cook, 2007, p. 145). Her collection of shells was vast and will be discussed further in chapter six. Bentinck was a Bluestocking, part of a society of intellectuals run by women among the pre-eminence of male-dominated clubs and societies discussed earlier in this chapter. The philosophy of the Bluestockings was cultivated by Bentinck's friend and correspondent Elizabeth Montagu. The term came to refer specifically to intellectual women and to embody the Enlightenment belief in freedom of enquiry (Eger, 2010, p. 13). Montagu's legacy, through the Bluestockings, was to "forge a public identity for the female intellectual and socially useful individual" (ibid.). As a member of this society, the Duchess of Portland achieved renown in the field of natural history to rival that of her male contemporaries.

The patronage of the botanical world was one in which women of the gentry were able to actively participate, their wealth and status affording the same opportunity to collect, and the connections of men of a similar rank. Cook notes that the Duchess of Portland was part of a female botanical network which included Mary Delany, and Queen Charlotte, consort of George III (Cook, 2007, p. 146). Despite the duchess's wealth and status, Cook is clear that she was no dilettante, and that she possessed a knowledge of natural philosophy to rival those of her eminent correspondents. Rousseau, despite his well-known prejudicial views on women scholars, acknowledged her botanical knowledge as greater than his own (ibid., pp. 146-147).

Bentinck was clearly an avid collector, but unlike those who collected for novelty, she was interested in the knowledge, both known and yet to be discovered, that her collections held. Not content with simply amassing items and plants, the duchess invited Daniel Solander, the eminent botanist, student of Linnaeus and colleague of Joseph Banks on the first *Endeavour* voyage, to curate her collections at Bulstrode Hall (Cook, 2007, p. 145). The duchess was extremely well-connected, and on good terms with many eminent natural philosophers who visited the house for discussion and to view the collections, including Joseph Banks, William Curtis, Samuel Goodenough and Thomas Pennant (Bowden, 2004). She also subscribed to *Flora Londinensis* which was authored by William Curtis with whom the duchess had a reciprocal

exchange of knowledge and materials facilitated by the naturalist John Lightfoot (Laird, 2015, p. 298).

Lightfoot (1735-88) was domestic chaplain to the duchess and was also employed in cataloguing her natural history collections and discussing elements of natural history with her and her close friend Mrs Delany (Bowden, 2004). Lightfoot was co-founder of the Linnaean Society with botanist J.E. Smith, and while women were not admitted as members, Smith gave lectures at his house in Chelsea which the Duchess of Portland, and other eminent women attended (Campbell Orr, 2004, pp. 172-173). The Duchess of Portland's Bluestocking friend, Elizabeth Montagu, wrote to her in an undated letter, referencing a meeting which the duchess was shortly to attend. Montagu wrote,

> "the Virtuosi are a quiet kind of people, & do not turn a meeting into a Rout or a Hurricane, but their Curiosity may be more troublesome than the unthinking vivacity of the Gay: for they examine the motions of the heart, the Structure of the Head, & make nice Disquisition into the state of the Brain, whereas the Polite visitant examines only the Brilliant Crop that glitters on the Bosom, observes no more of the Head than the Curling of the Hair, and inquires no farther into the State of the Brain than to observe whether it has well directed in the choice of the Top Knott; & let us not blame either Beau or Virtuoso, every employment of so short a life is equally Vain" (UNMSC PwE 30, n.d.).

Both ladies existed in the realm of the learned societies, and used the term *virtuoso* positively, although did not consider themselves as such. Although three generations apart, both Mary Capel Somerset and Margaret Cavendish Bentinck were able to forge identities as knowledgeable practitioners of natural science due to their connections and capacity to cultivate and grow. As a result, they earned respect among their contemporary scholars, a testament to the transformative potential of knowledge as a social tool.

Also keen to be perceived as a credible scholar, John Stuart, third Earl of Bute was interested in plants and collecting from an intellectual perspective. He was a friend of Isaac Lawson, a fellow Scot and friend of Linnaeus who studied medicine under Boerhaave and van Royen, had links with the plant merchant Peter Collinson from an early age, and was a regular correspondent of the Dutch botanist Gronovius. Stuart's house at Highcliffe included a laboratory in addition to a natural history and fossil room and a large collection of books (Samuel, 2010, p. 12). In 1785 he published a nine-volume work, *Botanical Tables Containing the Families of British Plants*, containing 654 hand-coloured plates. Only twelve copies were ever produced, however, the nine-volumes of each and the indulgent images costing the earl over £10,000 (Coats, 1975, p. 44). "Tabulae Plantarum" is listed as an item of sale in the auction catalogue following Stuart's

death. It is listed as, "Being a complete Collection of Botanical History accurately drawn and painted by different Artists, and arranged by his Lordship; many of the drawings are on vellum, and finely executed" (Leigh and Sotheby, 1794, p. 53). The earl kept two copies for himself and distributed the other ten with Joseph Banks, the Count de Buffon[24], Queen Charlotte, Catherine the Empress of Russia and the Duchess of Portland being among the recipients, although the work is often regarded as being more opulent than useful (Coats, 1975, pp. 44-45).

In addition to his own scholarship, Stuart also supported the work of others; both Albrecht von Haller's *Bibliotheca Botanica* (1771) and John Hill's *Eden* (Hill, 1757) are inscribed to him and two genus of plants, *Stewartia* and *Butea*, were named after him (Schweizer, 2009). According to the *General Evening Post*, this was due to the fact that, "Lord Bute's botanical skill was highly prized by Linnaeus, and that this great philosopher has, according to custom, a new plant by the name of STUART" (General Evening Post, 1783, p. 65). He was interested in many aspects of natural history alongside botany, including mineralogy to the level of theories of the earth and chemical analysis (Schweizer, 2009), applying new theories of chemical analysis to his mineral collection with a view to developing a new mineral classification (Miller, 1988, p. 232). Additionally, he kept a collection of astronomical, philosophical and mathematical instruments, and is said to have invented a new kind of microscope (Coats, 1975, p. 39).

Despite this dedication and his attempts at mineral and plant classification, there is no enduring trace of Stuart's influence on the scientific record. Here was clearly a man who valued collection and science, yet his work is frequently considered to be second rate and amateurish, for example Coats' assertions outlined above that his published work was opulent rather than useful. Miller (1988, pp. 226-227) has disputed this within his argument that Stuart has been a victim of later Whig whitewashing of botanical history, as discussed in chapter two. He claims that Stuart was a serious scientist who planned, in time, to present a fully generalised system of plant classification in reaction to the problems he perceived in Linnaeus' system, although this was never realised. In addition to later Whig influences, Miller (ibid., p. 229) also suggests that the passions and jealousies which surrounded Stuart's political career in the 1760s 'spilled over', and shaped perceptions of his scientific persona, in addition to increasing his isolation and denying him the lucrative networks enjoyed by other collectors of the period. He is an example of how a discredited personality may undermine an individual's efforts in scientific progress, and hamper our efforts to understand the impact of private scientific work on the wider intellectual sphere.

The difficulty of linking scientific endeavour with plant collections is also exacerbated by a lack of survival of evidence, and the split in contemporary disciplines of science and horticulture.

[24] A celebrated French Naturalist.

There are many examples, however, which may prove fruitful with further investigation. Charles Hamilton of Painshill, for example, was an avid collector of gardening literature, owning a library of books including authors Philip Miller, Richard Bradley, Charles Plumier, John Parkinson, Clusius, Theophrastus, John Ray, Herman Boerhaave, John Evelyn and John Hill (Symes, 1983, p. 113). While aristocrats and the gentry could gain social kudos by engaging in the scientific process, wealthy professionals such as Richard Richardson (1663-1741) and later John Fothergill (1712-1780) also used knowledge and scholarship to enhance their social status and networks.

Richard Richardson falls both into the professional and patron class of natural historical scholars in the early-eighteenth century. He inherited Bierley Hall near Bradford in West Yorkshire, but also trained as a physician (Courtenay, 2004). Educated at Oxford, Gray's Inn and the University of Leiden, he was fascinated by plants and botany. His garden at Bierley Hall was rich with plants and in it he cultivated both natives and exotics. He had a valuable library of botanical and historical works and corresponded with many of the significant naturalists of the day, including Hans Sloane, Dillenius, Gronovius and Petiver (ibid.).

Being a wealthy man, a professional physician and a dedicated botanist placed Richardson in a fortunate position. A learned man who was elected FRS[25] in 1712 and contributed several papers to the *Philosophical Transactions*, Richardson could also afford to patronise less wealthy naturalists, gardeners, and collectors including Samuel Brewer and Thomas Knowlton (Courtenay, 2004), latterly employed at Burton Constable. He also corresponded with, and worked with, botanists of much less wealth, including Adam Buddle[26], a cleric and botanist whose *hortus siccus* now forms part of the Sloane Herbarium (Turner, 1835, p. 87) which will be discussed in chapter seven. Both a patron and learned gentleman, Richardson was identified by Dillenius as one of the two men, alongside Sherard, who had most enlarged the list of species and identified the distribution and habitats of flora (Courtenay, 2004). In May of 1702 Hans Sloane wrote a letter to Richardson in which he noted that the members of the Royal Society, "hold themselves obliged to you for the pains you have taken in promoting natural learning" (Turner, 1835, pp. 43-46).

Thus, Richardson successfully bridges the gap between patron and professional in the eighteenth century. He engaged with the *virtuosi*, a letter from the antiquary Ralph Thoresby to Richardson in 1708-9 noting in the opening that, "several eminent Virtuosos enquired particularly of you at Gresham College[27] where one of your letters was read with great satisfaction" (Turner, 1835, p. 96). This portrays the eminent scientists of the period almost as

[25] Fellow of the Royal Society
[26] Mr Buddle gave his name to *Buddleja*
[27] The meeting place of the Royal Society

celebrity, and persons' to be revered and collected in themselves. Richardson's correspondence provides an insight into the activities and motivations of a wealthy man and professional, dedicated to the study of botany and the furtherance of horticulture.

Like Richardson, Dr. Fothergill approached the study of plants from his background as a physician. Unlike Richardson, he was not born into money, but did become wealthy later in his career (Thompson, 1782). Fothergill's academic background and his busy career as a physician provided him with a solid grounding in scholarship and natural philosophy. Following an apprenticeship he graduated from Edinburgh in 1736 as the only MD graduate that year (DeLacy, 2004). Fothergill published widely on medical matters and became an extremely successful physician and naturalist. He was elected FRS in 1763, was one of the earliest members of the American Philosophical Society (Elliot, 1782) and gained such notoriety he had *Fothergilla*, a genus of shrubs, named after him by Linnaeus.

Fothergill was interested in botanical publications and the advancement of knowledge in the sphere in addition to his medical learning. His memoir recorded his support of one endeavour,

> "It must not be omitted, that the Doctor generously patronised and superintended the great botanical work projected by John Millar, being an illustration of the Linnaean System, with very correct copper-plates, of which the great Linnaeus lived to see some specimens, and received them with the utmost commendations" (Thompson, 1782, p. 39).

He also published on botanical subjects, including on the natural salts of plants and the use of hemlock (Elliot, 1782, p. contents). Not limited to botany, however, he published widely on medical matters and his memoir also records his support for other subjects of curiosity and knowledge enhancement,

> "In those wonderful discoveries exhibited in the history of Corralines, and other marine productions, by the ingenious John Ellis, F.R.S. the Doctor was very assisting by his generosity, his communications, and his friendships; and in the curious historical account of coffee by the same author, the reader may see the part he took in that work of national concernment" (Thompson, 1782, p. 36)

The benefit of his work to wider society was one of Fothergill's motivations. Botanical gardens grew from a drive for economic gain, and interest in this idea pervaded the gardens of some private collectors, including Fothergill. In one memoir of the physician it was noted that,

> "…in the enjoyment of horticulture, the mind elevated to sublime contemplation, could not be restrained by the partial motive of a mere collector; and he that in his pursuits

> enlarges this speculation to the *cui bono*, will never want ample occasions of promoting general good, in the study of vegetable nature, which teems with so many blessings to mankind : whoever considers the importance of clothing, of household furniture, and of his daily bread, cannot but view it as one of the most useful, and consequently one of the most rational pursuits of an enlightened understanding" (Lettsom, 1786, p. 43)

The interest in plants of economic significance stated by Lettsom is clear, and Fothergill actively pursued many avenues in his own garden,

> "...he pointed out what would suit different soils, and formed a balance in the productions of the globe: from *America* he received various species of Catalpas, Kalmias, Magnolias, Firs, Oaks, Maples, and other valuable productions, which became denizens of his domain, some of them capable of being applied to the most useful purposes of timber; and, in return he transported Green and Bohea Teas from his garden at Upton, to the southern part of that great continent, now rising into an independent empire : he endeavoured to improve the Coffee in the *West-India* islands; the Bamboo cane (*Arunda Bambos*) calculated for various domestic uses, he procured from China, and purposed to transplant it to our islands situated within the tropics" (Lettsom, 1786, pp. 44-45).

Lettsom went on to discuss Fothergill's involvement in the successful cultivation of nutmeg, cloves and cinnamon, and his interest in growing and experimenting with many plants for medicinal purposes including hemlock (Lettsom, 1786, pp. 45-47). So, whilst Fothergill planted to augment his landscape (as discussed in chapter three), and collected for his interest in exotics (as discussed in chapter four), he was also interested in plants which were useful to his fellow man through economics or medicine. Such a diverse range of plants would have taken great effort from his gardeners to cultivate, and much thought and experimentation to procure, propagate, evaluate and disseminate the most useful samples.

Fothergill's work, in addition to the contribution of the individuals discussed in this chapter, demonstrates that a variety of motives were embedded in the creation of a plant collection, but that many were based on science and progress. Again, however, the fragmentary nature of the evidence has meant that these links are not often addressed in modern scholarship, due to the difficulty of building a broad and cohesive picture of the movement. The evidence from Burton Constable, whilst fragmentary in itself, can help to add to the picture.

WILLIAM CONSTABLE AND SCIENCE

CONSTABLE'S INTELLECTUAL ENDEAVOURS

In addition to his opulent taste in culture and art, William Constable considered himself a learned gentleman with broad knowledge and ability. In a letter to his college tutor John Needham, he described himself;

> "I am Likewise a Collector, a bit of a Vertu, was once in Esteem as an Electrician, and am sometimes an Astronomer & have Knowledge Enough of Natural History" (Bodleian Library MSS English Letters C.229 ff.125-6, c. 1769)

FIGURE 20: A GRAND TOUR PORTRAIT OF WILLIAM CONSTABLE AND HIS SISTER WINIFRED DRESSED AS MARCUS PORCIUS CATO AND HIS WIFE. BY ANTON VON MARON (BURTON CONSTABLE HALL).

A Grand Tour portrait of himself with his sister Winifred (figure 20) painted by Anton von Maron (1733-1808), depicts the siblings as Marcus Porcius Cato and his wife (Connell, 2014, p. 16) and highlights Constable's wish to be seen as a man of enlightenment. He had been educated at Douai College in France and kept a house in London, but shared his frustrations about the cosmopolitan life in the same letter to John Needham;

"after having Livd for many Years in What is Calld the Great World, Where Manners & Le bon ton are acquird but no Knowledge. I retir'd to my Country Seat where I am placd at the Head of a very large, well appointed, & by the Help of my Sister, an Exceedingly well regulated family." (Bodleian Library MSS English Letters C.229 ff.125-6, c. 1769)

His yearning for knowledge and purpose are clear, and Constable amassed a library of significant size for study and self-improvement. By 1775 it included nearly 9,600 books, many inherited from his father (Boyd, 1998, p. 31). An unpublished list which details books sold from the house in 1889 includes almost 4,000 titles dating to Constable's lifetime or before, and shows that common themes in his library included natural history and philosophy, botany, zoology, geography and travel (Burton Constable Hall, n.d.). Constable owned three works by Francis Bacon, Monboddo's *Antient Metaphysics: or, the Science of Universals*, Galloway's *Philosophy and Religion Considered in their Mutual Bearings*, Catesby's *Natural History of*

Carolina and many other works on natural history subjects (Burton Constable Hall, n.d.). He regularly purchased books from Whiston and White's, the London bookseller. Extensive purchase lists survive, including one from 1763 which spreads to two sides of parchment and lists over 40 books (ERRO DDCC/153/53, 1763). One of the owners of the booksellers, Benjamin White, was associated with William Curtis, the English botanist and entomologist; Constable subscribed to Curtis' *Flora Londinensis* in 1777 (Curtis, 1777). Towards the end of his life Constable also subscribed to Richard Steele's *An Essay Upon Gardening* (1793), a book closely associated with Benjamin White. Steele's book contained significant details on exotic plants and how best they were grown in Britain; even when Constable's health had failed and he could no longer conduct science of his own, he remained interested in cultivation and supported others in the development of knowledge.

Constable's dedication to the natural sciences is demonstrated in an undated list of thirty-eight books in Constable's hand and labelled "books of natural history" and "books of natural philosophy" (ERRO/DDCC/145/8, undated) with brief annotations. Clusius and Gesner's works were both "old but good", Knorr's *Lapides Diluviani* was "Exquisite" and Klein's *Historiae Avium* comes with the recommendation "this you must read", however, of Seba's[28] 'museum' he noted "in general fine plates, author ignorant". It is possible that this was a list of recommendations to someone else, perhaps his younger brother Marmaduke Tunstall.

Constable's intellectual endeavours extended further than his library, and he was active in his pursuit of knowledge. His desire to understand the natural world manifested itself in the assemblage of collections, of natural history, historical artefacts and experimental instruments. These, and his attendance at experimental scientific demonstrations will be discussed further in the next chapter. There is evidence, however, that in addition to collecting and classifying, he also conducted his own experiments, although only fragmentary evidence remains. During the decade in which he kept a menagerie, he wrote to his previous tutor John Needham to ask for some advice,

> "I beg leave to profit of your Kind offer of Service to Give you the following trouble. Some years ago I met with a strange Account, as it then appeard to me, of a tendency to breed between a Rabbit & a hen, I tried the Experiment in my own Menagery & had reason to think I had one Clutch from this strange Connection. Since which time I have been Informd that such a breed has been propagated at Brussels, & is still kept up.
>
> I never Succeeded but once, my Chickens when young had shorter wings, & more Down than the Common Sort, & I thought more bone… On the Whole appeard like other birds of that sort & some of them bred again. Now I Could wish to know if any Particular

[28] Albertus Seba (1665-1736) was a pharmacist, zoologist and collector from Holland.

> species of Rabbit or fowl is to be preferd, if any Great art is requird to bring them acquainted. if a species so producd will breed again in General. If these things are so; Methinks that very Dark Subject of Propagation from a male & a female becomes still more Intricate for the Chickens Shew nothing of the shape, nature, or manner of the Sire." (Bodleian Library MSS English Letters C.229 ff.125-6, c. 1769).

Although Constable's efforts to cross a rabbit and a chicken did not meet his expectations, he was clearly engaged in the process, conducting his own observation (if not particularly carefully), and seeking out the results of others in order to improve his chances of success. His correspondence with John Needham, a priest who also published on the spontaneous generation of micro-organisms and is often cited as a catalyst for materialism, underlines his deist's empirical approach, and an enthusiasm to share knowledge.

Notably then, and despite the extensive archive of letters, there is little record of Constable seeking to correspond with many influential thinkers of the mid-eighteenth century, with the exception of Jean-Jacques Rousseau. The Burton Constable library contained Rousseau's complete works, a philosopher who William evidently admired and who he met in France on his Grand Tour of 1769-71. Evidently in homage to Rousseau, whilst on the tour William commissioned a pastel portrait of himself by Jean-Etienne Liotard (1702-89), which shows him dressed as an Armenian merchant (Connell, 2014) (figure 3); Rousseau had returned from political exile in Switzerland dressed as an Armenian merchant that same year (McCabe, 2008, p. 202). Constable's desire to seek out this philosopher in particular, and his portrayal in the same costume openly showed his admiration and allegiance. It is uncertain whether Rousseau was a particular social target realised on the trip, or if the meeting was by chance. If the latter, Constable certainly capitalised on the meeting and celebrated his new contact.

Correspondence between Rousseau and Constable appears in a collection of letters edited by Chichester-Constable and Courtois (1932), detailing the meeting and later discussion. On a trip to France in the early 1770s Constable wrote to his brother Marmaduke of their first meeting, after he found Rousseau was staying in the same town.

> "Old Rousseau in town with his Lady. He seems to me in Conversation, the simplest, & most candid of men. I applied to many to Introduce me, all seemed to apprehend his Displeasure. I sacrificed some hours of rest, and boldly wrote a french Letter to the best writer of the age; However it answered my purpose, He appointed an hour & I attended. I laid aside all apprehension of Language, & Conversed with him, with openness upon such subjects as come home to men" (Chichester-Constable and Cortois, 1932, p. 166).

The correspondence is not extensive, but does document conversations about literature, culture and botany. In these letters Constable exceeded even his usual enthusiasm for his subject and was clearly in awe of the philosopher.

> "The honour of your acquaintance I look upon as one of the happiest Epochs in my Life. At parting I wished to say something but I could say nothing because I felt as I aught".
>
> "Wherever I am & as long as I breath, I will ever admire, respect & Love you as the first of mankind" (Chichester-Constable and Cortois, 1932, p. 173).

He was obviously moved by Rousseau and valued his theories and friendship. Rousseau worked on his *Reveries of a Solitary Walker* between 1776 and 1778, not long after these meetings, although the manuscript was only published posthumously (Rousseau, 1783) when it was purchased by Constable. Rousseau's 'walks' particularly note the plants he studied as he had been particularly fascinated by botany since the 1760s (Calmann, 1977, p. 48). Indeed, his *Letters on the Elements of Botany* (Rousseau, 1787) – also published posthumously - is credited with popularising botany at the time in both Europe and America (Cook, 2007, p. 142). This is perhaps due, in part at least, to its being written for children, and therefore being more immediately accessible to many than the very complex language of other botanical works of the time.

The botanical thread is evident through Constable's correspondence with Rousseau. Following their first meeting in 1770, William was moved to send Rousseau a copy of John Ellis' '*Directions for Bringing over Seeds and Plants*'. He particularly noted that in the book 'is represented a new sensitive plant found in Philadelphia', this being *Dionea muscipula*, or the venus fly trap. The novelty of the nastic movement is presumably the aspect which prompted Constable to single out this plant in particular to gain the interest of the philosopher, although Rousseau extended thanks for the gift without engaging in further discussion on the subject. It was not unusual for Rousseau to corresponded widely on the subject of botany, notably with the Duchess of Portland in England with whom he also botanised and for whom he collected plant specimens and seeds (Cook, 2007). His letters to Constable were less extensive, although enthusiastically received. It is uncertain as to why, but perhaps Constable did not excite Rousseau intellectually in the same way as the others, was not as socially advantageous as a contact, or was perhaps too focussed on the cultivation of the exotic for his taste. Rousseau advocated a naturalistic approach to gardening, and whilst he engaged a little with the idea, the collection of exotics and heavily bred plants was a moral issue for him, he found it distasteful and unnatural (Cook, 2002). This view engendered significant disagreement in the friendship of the philosopher and the Duchess of Portland, their correspondence ending after she sent him a work of exotic

botany, the *Herbarium amboinense* of Rumphius (Cook, 2007, p. 156). Constable clearly did not share Rousseau's views on this matter, and his liking for exotics perhaps dampened their potential friendship too.

Despite the significant value Constable placed on this connection with an eminent philosopher[29], there is no evidence that Constable actively sought the council of a learned group, as did many other scholars of the time. William became a member of The Royal Society in 1775, although this was well after the zenith of his application to botany and collecting, and there is no record of him attending meetings. Marmaduke Tunstall proposed his half-brother to the society, along with Joseph Banks, Daniel Solander the Swedish naturalist, and William Hudson the British botanist. The proposal note stated that Constable was "deeply versed in natural history and every branch of polite litterature [sic]" (The Royal Society Archive, 2014). He was also a member of the Society of Antiquaries.

No evidence remains for a relationship between Constable and his Royal Society proposers apart from his brother in law. Given that the surviving portion of the Burton Constable correspondence is so well preserved, it is possible that significant discussions did not occur, although the original Rousseau letters are missing and so it is conceivable that evidence had been lost for other relationships. Constable's position and enthusiasm for his subject would have been acceptable catalysts for friendships and correspondence with the leading scholars and horticulturists of the day. It is curious, therefore, that he appears to have either made no attempt to pursue this, or that his advances were not returned. Particularly when other members of his family enjoyed fruitful relationships with leading natural philosophers.

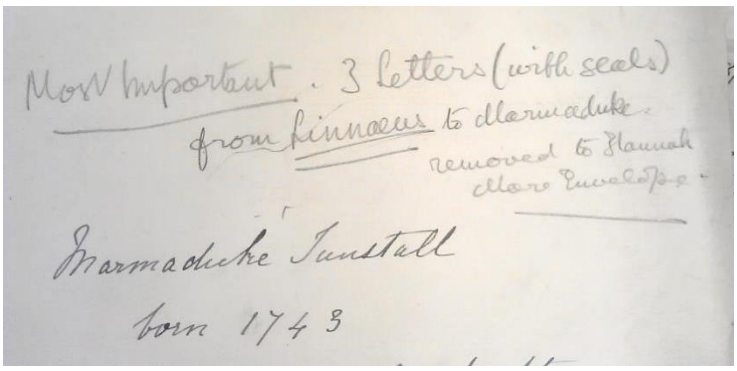


FIGURE 21: NOTE FROM ERRO SUGGESTING FURTHER CORRESPONDENCE BETWEEN TUNSTALL AND LINNAEUS (ERRO DDCC/144/11)

Marmaduke Tunstall had similar prospects in life to Constable. He was born of the same family in the north east of England, inherited an estate and was prohibited from much of public life by his Catholicism. Although twenty-two years Constable's junior, Tunstall arguably surpassed his elder brother to become a member of the Royal Society four years earlier in 1771, following membership of the Society of Antiquaries in 1764, aged only twenty-one. Based on the evidence of his correspondence with Linnaeus

[29] He made sure to note to Rousseau that, "I saw Voltaire, & did not applaud, we disagreed at the Door of my Coach" (Chichester-Constable, 1932, p. 174)

(Tunstall, July 26th 1773), (Fox, 1827, p. 14), Joseph Banks and Thomas Pennant (Jessop & Boyd, 1999), he was also better connected. In 1783 two of his letters to Sir Joseph Banks on the observation of two 'Lunar Iris', what we now understand as a lunar rainbow, were published in the Philosophical Transactions (Tunstall, 1783). As mentioned above, he was also the author of *Ornithologia Britannica,* published in 1771 (Tunstall, edition 1880), one of the first British texts to use the binomial system and one which he sent to Linnaeus for comment in 1773 (Tunstall, July 26th 1773).

Tunstall's original correspondence with Linnaeus is kept by the Linnaean Society. It includes testimony that Tunstall sent Linnaeus samples of shells which had returned to Britain on the ship Endeavour with Joseph Banks and Daniel Solander (Linnaean Society, 1772b). The link with the two eminent scientists is clear, and the correspondence with Linnaeus is evidently even greater than this collection. A note found on a scrap of paper at the East Riding Records Office in Yorkshire reads "Most Important. 3 letters (with seals) from Linnaeus to Marmaduke removed to Hannah Moore Envelope" (ERRO DDCC/144/11) (figure 21). The eventual destination of the letters is unknown, but it is evident that Tunstall was corresponding with this most influential botanist of the day, on the subject of items he had received from the eminent explorers. The evidence suggests nothing of Constable developing similarly high-profile contacts in the arenas of collection and science. Equally, he never became recognised as a great thinker or innovator of his age.

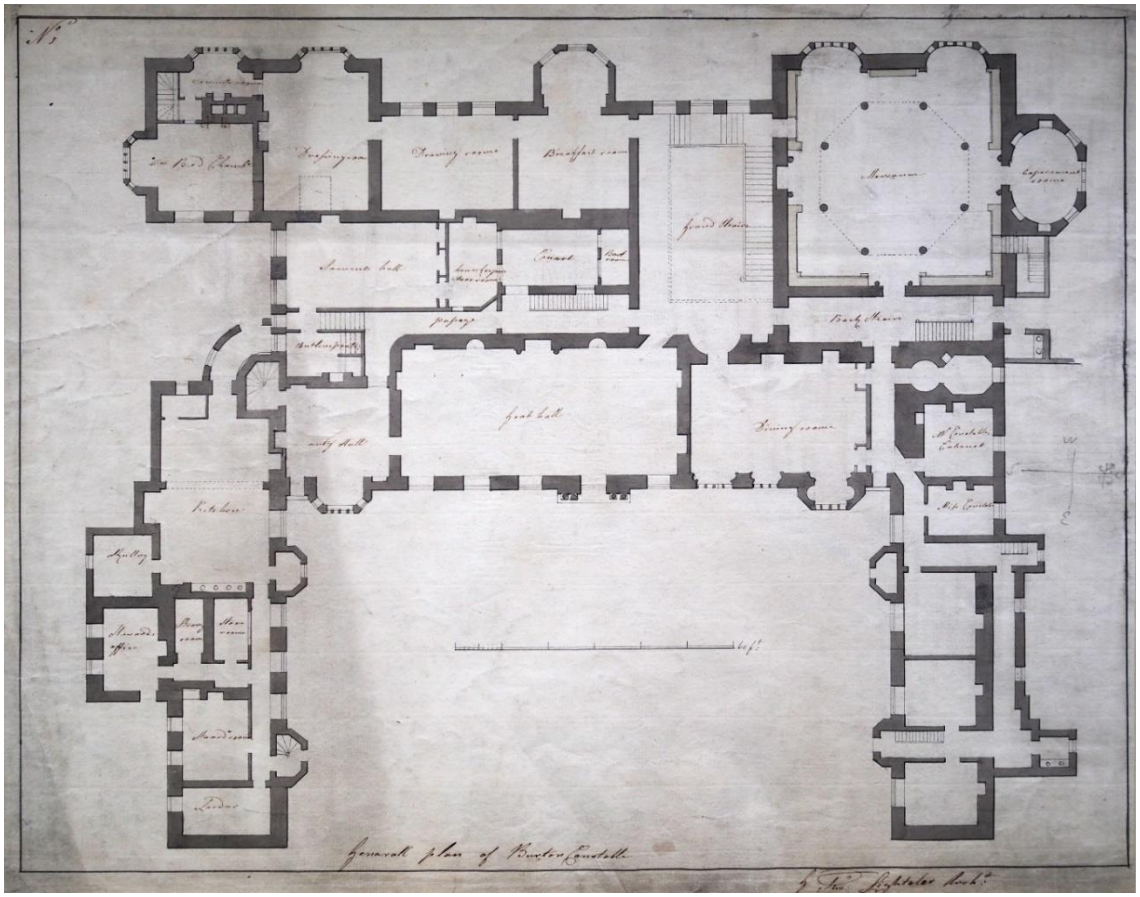


FIGURE 22: PLAN OF BURTON CONSTABLE HALL C. 1750 TO 1760 BY TIMOTHY LIGHTOLER, SHOWING A MUSEUM, EXPERIMENT ROOM AND 'W CONSTABLES CABINET' AT THE TOP LEFT. IT IS THOUGHT THAT THIS PLAN MAY HAVE BEEN REALISED IN THE 1750S AND 1760S BEFORE BEING REPLACED BY THE BILLIARD ROOM AND GREAT DRAWING ROOM IN THE 1770S (AUTHOR).

As an independent scholar, however, Constable provided himself with all the required furnishings. His menagerie, stove and stove garden made up his outdoor arena, and his indoor facilities were no less impressive. Figure 22 shows a ground-floor plan of the house from between 1750 and 1760. It is uncertain whether the plan was ever realised, but the intention is clear. To the north west of the plan (top right) can be seen the largest room on the ground floor; Constable's museum, with an experiment room attached in a bay to the north. It was accessible from the grand staircase and the back staircase, which leads to a smaller room titled, 'Mr Constable's Cabinet'. The room labelled as the cabinet is around four and a half metres square; if this was the room previously used to house William's natural history collection, it had either become too small, or was not of sufficient grandeur to show off the artefacts to guests. Significantly, the new museum was larger than the dining room, and even larger than the great hall. The ground plan remains similar in the layout of the house today; the current great drawing room which shares a footprint with the museum is an impressive sixteen metres square. Internal structures visible around the walls of the museum on the 1750s plan are

presumably display cases in which Constable's cabinet contents, to be discussed further in the next chapter, were housed.

The location of the museum in relation to Constable's first stove and stove garden seems unlikely to be a coincidence. During the first phase of the hall and garden renovation from the late 1750s to the late 1760s, the gardens containing Constable's botanical collections would have been visible out of the two bay windows in the museum room, thus making his collections as a whole, and therefore his mastery of classification, visible as one to any guests of the house. This juxtaposition, the experiment room and the scientific instruments which will be discussed in the next chapter suggest that Constable saw himself as a man of science; collecting, investigating and classifying all manner of items of natural philosophy. The suite of indoor and outdoor facilities marks out Burton Constable Hall as a living laboratory of the mid-eighteenth century.

The evidence available relating to the life, character and activities of Constable suggests that he was a learned gentleman who valued knowledge and the patronage of those who possessed it. His connections were reasonable, but there is nothing to suggest they were as extensive as those of his half-brother, Marmaduke Tunstall. Unlike Tunstall, he did not actively seek the council of other learned men, nor did he receive it in abundance. His most eminent connection was that with Rousseau, which he valued and celebrated enthusiastically. Constable valued his societal status and embraced new fashions, and was also interested in the natural world and the past. He was a collector of ideas and prized current theory and practice in all manner of subjects, but did not contribute to their wider development through societies or publications. Nevertheless, his broad and keen interest in the natural world led him to collect avidly, and to build an impressive cabinet of natural philosophy.

As ephemeral artefacts, plants are often overlooked as historical agents of change outside the more commonly understood broad economic trade networks of botanical gardens and merchant organisations. This chapter has aimed to set eighteenth-century botany and plant cultivation firmly within the scholarly arenas of science and knowledge generation, applying Baconianism, social networks and scientific popularisation to the discussion. The wealthy and interested sought knowledge and understanding through professional networks, extensive libraries and their own experiments. New empirical methods had spread throughout learned circles in the early modern period and proved to be the foundation of discovery in the Enlightenment and botany was one of the earliest vehicles of this transformation. The enthusiasm this generated spread beyond insular scientific circles and caused an intellectual revolution. The popularisation of knowledge through societies and coffee houses as well as the

proliferation of published works allowed more people to educate themselves in the principles of the new science, and to become informed participants themselves. Through these social outlets, achievements could also be demonstrated, and advantageous relationships could be formed. Alongside observations of natural history, the collection and study of plants blossomed, now a pursuit which spoke of wealth and status, but which now also demonstrated knowledge and scholarship.

Natural history and later, natural philosophy were popular spheres of science which offered justification and meaning to the cabinets of curiosity of the sixteenth and seventeenth centuries. When the increasing fashion for scholarship meant that collection for the purpose of wonder alone became vulgar, the curious aimed to collect a representation of the world in order to make empirical observations. Plants were as great, or even a more significant part of this tradition as shells, experimental equipment, gems, stuffed animals and fossils. The wealthy were practical enablers, their status-driven membership of the Royal Society validated by their means to collect, cultivate and preserve and offer the fruits of their estate for study. The endeavour brought social connections to collectors of both the professional and gentry class, both creating and benefitting from social networks based on knowledge. As such, collections, including those of plants, were active agents in the intellectual and social development of the eighteenth century, and it is these collections which will be considered in more detail in the next chapter.

CHAPTER 6: PLANTS AS COLLECTIONS

A proliferation of evidence exists for the feverish collection of a wide variety of plant material in the eighteenth century. Whilst nurseries were thriving centres of trade and seeds and roots were shipped from all over the world, there was also a huge demand for preserved plant specimens. This distinct and significant subdivision of the study of flora is often overlooked in a study of garden history, but forms a vital link between gardens, cabinet collections, natural philosophy and knowledge generation. As such, investigation into historical herbaria has a valuable contribution to make to histories of both collecting and the natural sciences, and also has the potential to shed new light on eighteenth-century flower gardens. The collection of plants for the purposes of botany, science and curiosity, based on new and stimulating structures of knowledge and the new science of observation and empiricism, revealed new possibilities and modes of study. These collections offer us a clearer insight into alternative motivations for the collection of both native and exotic plants, and therefore the function of the garden during the Enlightenment.

The fact that the wealthy acted as patrons of learning, and brought together natural curiosity collections and scientific instruments for both themselves and their friends, associates, scholars and employees is not a new concept, being discussed by Turner (p. 213) as early as 1967. Natural philosophy collections have only relatively recently been considered as contributors to the history of science, however, and many studies have now concluded that the formation of cabinets or museums played a significant role in the development of knowledge in the seventeenth and eighteenth centuries. Arnold (2006, p. 2) has argued that, "seventeenth-century English museums provided a forum and workshop in which a vitally important aspect of the scientific revolution took shape: namely various "natural historical" practices, observation, and experimentation". He goes on to demonstrate that far from being incidental to the intellectual upheavals of the time, "this transformation in the relationship between the realms of knowledge and the physical world has to be placed at its very core" (ibid.).

As chapter five demonstrated that horticultural and botanical thought was an integral part of the scientific developments of the eighteenth century, this chapter will argue that plants were an integral part of contemporary collection and are therefore subject to the same social theories. It will provide an overview of cabinet collecting in order to give a context to the inclusion of plants, followed by an overview of the cabinets of various case studies to highlight various links to scholarship, horticulture and their role in the production of knowledge. It will set plants firmly in the context of cabinet collecting, and to discuss how the objectives of

collecting informed horticultural activities. The cabinet and its component plants will be discussed not as a passive phenomenon, but as an active agent of knowledge development in the eighteenth century.

CABINETS AND COLLECTIONS

Holding and building a collection of artefacts was common among the gentry and aristocracy in the eighteenth century. Modern scholarship, including that from Impey and MacGregor (1985), Arnold (2006) and MacGregor (2007), has improved the understanding of historical collections over the past three decades, often as a product of research into the history of museums. The tradition stemmed from the cabinet of curiosity which began in earnest as part of the Renaissance and continued throughout the seventeenth century. As demonstrated in the discussions of wonder and curiosity in chapter five, these concepts, bound up in the ethos of the cabinet, evolved over time and lent the cabinet differing connotations, substance and impact. The wonder and desire of the sixteenth and early-seventeenth centuries gave way to a more scholarly approach to gentlemen's cabinets in the eighteenth century.

While significant in establishing, developing and disseminating a new world-view for a period of around three centuries, relatively little academic study has been applied to the sphere of natural history collection when compared to the study of other historical artefacts, or to collections of art. Zuidervaart (2013, p. 4) has observed that in the Netherlands, the preservation of eighteenth-century cabinets of experimental philosophy, a particular phase in cabinet collecting, is poor, and items remaining in museums are often there only by chance. He observes that this is likely due to scientific objects being considered obsolete and worthless once superseded (ibid., p. 24), unlike art which retains an aesthetic value, and arguably increases its value over time. The same fragmentary nature of surviving collections can be seen in Britain as these fragile objects were often sold or discarded after the death of a collector.

The remaining collections, and parts of collections in Britain are extremely valuable to scholars as they suggest ways in which their owners were attempting to understand the world in the new culture of empirical science. Collection throughout this period both sprang from and helped to build a new world-view and to understand newly colonised lands. Shelton (1994) has identified the European approach to the New World and its curiosities as being one of the most significant lenses through which this shift in attitudes can be observed. However, the concept of the collection is not static, Marr (2016, p. 2) has highlighted ambiguity as being one of the defining characteristics of early modern curiosity and wonder; inconsistency and variety are hallmarks of collection culture. Individuals sought an eclectic mix of items based on their own interest, motivation and ease of procurement, bestowing each assemblage with its own story

and character. Therefore, we should not impose a rigid framework onto plant collections, but instead appreciate the diverse and nuanced structure of curiosity within which they were set. The concepts of wonder and curiosity are reflected by, but are also built from the attitudes of collectors to their collections and the intellectual significance they placed upon them. It is useful to summarise the history of the traditions of collecting, since their development is intrinsic to understanding the motivations and context of the eighteenth-century plant collector of living and dried specimens.

Sixteenth- and seventeenth-century cabinets of curiosity could contain a vast array of items, collected for a similarly vast array of reasons. They held items which were exotic, unusual, or a spectacle to viewers. The concept had arrived in Britain from the continent where different styles of cabinet were distinctly defined. The *Kunstkammer* contained fine and decorative art and the *Schatzkammer* contained jewels and precious metals, while the *Wunderkammer* contained items which were perhaps not beautiful, but which were rare and curious. Turner (1985) sees the *Kunstkammer* and *Schatzkammer* as tools primarily for self-aggrandisement, with the *Wunderkammer* fulfilling a different role, that of economic advantage. He sees the items contained within these cabinets as not just symbols of the far-flung empire, but as the tools of trade and prosperity which *empowered* empire. The contents therefore held great economic status and by turn, reflected this power to their owner.

The concept of the collection developed individual characteristics in England, influenced by the various cabinet models on the continent, but shaped by differing political, social and economic sub-contexts as identified by Swann (2001, p. 8) and Tiersten (1993, pp. 136-7). Whilst the noble classes did take to collecting fine arts, it was the concept of the *Wunderkammer* which became most popular, and it also permeated down the social scale (MacGregor, 1985) in addition to the nobility. Collections in Britain were numerous and diverse, and were held by a wider cross-section of society than those on the continent. Both professionals and wealthy amateurs were avid collectors. The endeavour was not only a personal one; scholars benefited from other collections through viewings and publications (Impey & MacGregor, 1985, p. 2). One of the most famous is the seventeenth-century cabinet of the Tradescants at Lambeth, an extensive assemblage that they called the 'Ark'. While both John Tradescant the Elder and his son, John Tradescant the Younger were gardeners, their collection housed a great number of curiosities from around the world, including weapons, jewels and traditional garments (Ashmolean Museum, 2011).

Collection during the sixteenth and seventeenth centuries was characterised by extravagant aristocratic collections and ostentatious display, which then spread to the wider elite, and to

the wealthy gentry and merchants (Swann, 2001, pp. 16-22). This process was fuelled by the development of consumerism in the early modern period and the boom in availability of exotic objects from overseas (ibid., pp. 6, 23-4). They were collections for fascination and interest, but increasingly, also for scientific advancement, classification and social status. MacKenzie (2009) has contextualised the shift, noting,

> "Cabinets of curiosities had contained the weird and the wonderful, exotica that seemed initially to be unknowable and unfathomable. Yet the act of placing such materials in the cabinet brought them into the realm of the potentially known and understood by being viewed and organised" (ibid., p. 1).

Thus, the cabinet became not a passive museum where items were stored and viewed, but an active agent in the continued discovery, understanding and domestication of the world.

Cabinets of the Renaissance have been discussed in many terms; they often reflect an Edenic nature in addition to an aesthetic and spectacular function, such as the cabinet of Frederik Ruysch who had a penchant for making displays out of foetal and infant skeletons (Zytaruk, 2011, p. 5). To the modern eye the eclectic mix of collected objects may appear random and disparate, however Impey and MacGregor (1985, p. 1) explain that "those very traits of diversity and miscellaneity which serve in our eyes to impair the serious intent of these collections were essential elements in a programme whose aim was nothing less than universality". The aim in Britain was not simply to collect the weird and the wonderful, but to facilitate an understanding of the world by collecting as much of its diversity as possible. The model of cabinet collecting was interpreted differently by individual collectors, and Zytaruk (2011, p. 19) has argued convincingly that varying manifestations of collections can be viewed as part of the cabinet model, including textual and visual art collections in addition to artefacts and natural specimens. This approach related closely to scientific endeavour and the impulse to understand and rationalise nature through classification, and as a result, items of natural history became particularly prolific in British cabinets. The expanding exploration of the world fed the collecting industry with increasingly disparate and fascinating natural objects.

The discovery of new lands and the specimens and artefacts which were returned to Britain shaped the construction of collections. The known and exploited world had expanded greatly from the mid-seventeenth century, resulting in a much-increased range of material culture and nature to study and to analyse. Items originating from the New World were highly prized and were wonderful as well as informative. Findlen (2006, pp. 287-288) has proposed that the expansion of collecting activities occurred in direct proportion to the proliferation of new trade networks between Europe and the Americas. Mere 'wonder' at exotic items was still acceptable in most social spheres, but from the eighteenth century was increasingly coupled with the

mundane and commonplace. Impey and MacGregor (1985, p. 2) note a shift in collecting trends at home after a proliferation of the introduction of artefacts from overseas. Collectors began to gather previously unconsidered items from their own culture to compare with those from elsewhere. In 1691, Nehemiah Grew noted in his catalogue of artefacts belonging to the Royal Society, "not only Things strange and rare, but the most known and common amongst us" (Grew, 1681, p. preface). Natural history, a favourite of collectors, was also included in this trend, with fossils [30], stones, insects, bones and, of course, plants among the most highly prized items. The situation in the early modern period is summarised by Arnold (2006, p. 4), "almost everyone involved with museums was basically motivated by wonder and curiosity and set about applying themselves to a broad range of research activities in its pursuit".

Travel and the cabinet became "mutually sustaining activities" (Swann, 2001, p. 23), the wealthy and interested travelled to collect, and also to marvel at the collections of others. Swann (ibid., pp. 24-26) has discussed the importance of wonder and the exotic in the formation of collections during this period, and has identified a shift in the habits of collectors when the concept of wonder became distasteful in the eighteenth century as discussed in chapter five. Collection was an acceptable activity for the elite and therefore linked to broader societal trends. The new science and shift to empirical modes of thinking had a significant impact, reflecting trends towards order and classification.

The cabinet became a physical embodiment of the ideals of Francis Bacon and his vision of empirical observation as a means of the advancement of science discussed in the previous chapter. Natural objects became as important as books in the quest for scientific knowledge, and building collections was a vital part of the formation of the means of understanding nature (Findlen, 2006, p. 286). Robert Hooke railed against the cabinet as a facility for pure wonder and objectification, asserting that,

> "the use of such a Collection is not for Divertisement, and Wonder, and Gazing, as 'tis for the most part thought and esteemed, and like Pictures for Children to admire and be pleased with, but for the serious and diligent study of the most able Proficient in Natural Philosophy" (Hooke, 1705)

Collections were taken seriously as scientific resources; some were kept by organisations such as the Royal Society, but many of the most significant collections were in private hands.

A passage in *Gesta Grayorum* (Greg, 1915, pp. 34-35), written in 1594 and often attributed to Francis Bacon, highlights the ideal of a learned gentleman's collection.

[30] At this time the term 'fossil' meant anything which was dug up (Cook, 2012, p. 165)

> "I will commend to your Highness four principal Works and Monuments of your self: First, The collecting of a most perfect and general Library, wherein whatsoever the Wit of Man hath heretofore committed to Books of worth, be they ancient or modern, printed or Manuscript, European or of the other Parts, of one or other Language, may be made contributory to your Wisdom. Next, a spacious, wonderful Garden, wherein whatsoever Plant, the Sun of divers Climates, out of the Earth of divers Moulds, either wild, or by the Culture of Man, brought forth, may be, with that Care that appertaineth to the good prospering thereof, set and cherished. This Garden to be built about with Rooms, so stable in all rare Beasts, and to cage in all rare Birds; with two Lakes adjoining, the one of fresh Water, and the other of salt, for like variety of Fishes: And so you may have, in a small Compass, a Model of Universal Nature made private. The third, A goodly huge Cabinet, wherein whatsoever the Hand of Man, by exquisite Art or Engine, hath made rare in Stuff, Form, or Motion, whatsoever Singularity, Chance and the Shuffle of things hath produced, whatsoever Nature hath wrought in things that want Life, and may be kept, shall be sorted and included. The fourth, Such a Still-house, so furnished with Mills, Instruments, Furnaces and Vessels, as may be a Palace fit for a Philosopher's Stone"
>
> (Francis Bacon(?) *Gesta Grayorum* 1594)

Many collections of the gentry broadly followed this model for the next two hundred years; gathering together items both natural and man-made, within a house and garden, to the purpose of assembling a universal record of the world. Particularly interesting to this study is the mention of a collection of plants of diverse climates grown within a garden setting, alongside a cabinet striving for a model of universal nature. Within the public sphere of collection, linking cabinets of curiosity with botanical gardens occurred as early as the 1590s in the botanical gardens of Padua, Pisa and Leiden, which set natural history collections alongside the outdoor garden collections (Findlen, 2006, pp. 283-285), linking the two in ideology. It is suggested here that this link also became commonplace in private collections.

As discussed in chapter five, the Baconian system of order and the trend towards scientific method, observation and empiricism became a hallmark of collections during the eighteenth century, giving rise to the cabinet of natural philosophy. Collectors began to order their assemblages systematically, and used them for study to facilitate an increased understanding of nature (MacGregor, 2015). Publicly accessible museums were developing and emerging from private collections. The Royal Society's Repository was set up in the mid-seventeenth century, the Ashmolean in 1683, and the British Museum in the middle of the eighteenth century.

Collections became active arenas of scientific investigation and discovery, rather than passive assemblages of objects.

With an increase in the popularity of scientific method and the advantages it could offer from broad based economic gain to personal social improvement, the eighteenth century saw a decline in the fashion of collecting for wonder. Individual interests in the formation and character of collections became commonplace (MacGregor, 2007, p. 30). Naturalists like Gilbert White (1720-1793) became well known, systematically studying and collecting nature in the Baconian mould. Turner (1985) and more recently Bennett and Talas (2013) clearly distinguish the concept of a 'cabinet of experimental philosophy', and the rise of the concept of the same name in the scientific sphere as a movement which grew out of curiosity collecting in the mid-seventeenth century. This did not necessarily replace the cabinet of curiosity as a repository of artefacts to represent all things known in nature, but represents an evolution of the concept. Arnold (2006, p. 3) notes a "gradual shift from a broad and eclectic form of investigation in the seventeenth century to a much more focussed one in the eighteenth". This shift, he notes, included a rise in classification as a core function of a museum or collection (ibid.). Thus, the cabinet of natural philosophy and experimental philosophy superseded the cabinet of curiosity.

In addition to changes in collection ideology, Arnold (ibid., p. 20) has also charted a shift in the nature of the collectors. The civil war had interrupted the collecting habits at the highest social levels, transferring impetus to the passionate collectors of the gentry and what Arnold (ibid.) calls the "merely wealthy" from the artisanal and mercantile classes. The gentleman *virtuoso* is then identified by Arnold as taking an increasingly important role in the world of collecting. The cabinet was a useful social tool, as the ownership of a collection and the networks surrounding its construction and display assisted a collector in forming social interaction outside their usual associations (MacGregor, 2007, p. 66). Swann (2001, p. 78)[31] has argued that curiosities became a demonstration of a gentleman's scholarly accomplishment and that they provided "a basis for exchanges with social equals and thus… the creation of a shared class identity". As such, the cabinet offered new opportunities, and a change to define oneself against a series of concepts and values which could be selected by the individual.

As new scientific discoveries were made, increasingly abstract concepts such as light, air and electricity also became interesting to collectors who began to collect artefacts which represented or demonstrated ideas which were less physically embodied. While scientific objects had been a significant feature of *Kunstkammer* and *Wunderkammer*, they had been primarily concerned with mathematics and measuring. The eighteenth-century cabinet of natural and experimental philosophy increasingly contained items which did not measure, but which made things visible or clarified principles, such as microscopes, thermoscopes and

[31] See particularly chapter 2.

eventually electrostatic generators (Zuidervaart, 2013, p. 4), buoyed by the proliferation of the experiment in scientific enquiry, and enabled by the availability of the equipment. These concepts became relevant to the garden-based collector through horticultural texts such as Miller's *Gardener's Dictionary* (1768) which drew on concepts such as temperature and discussed the importance of the properties of air, water and matter for which Elliott (2011) has provided a thorough overview.

The new type of experimental cabinet contained items which investigated the concept of a more abstract nature, and provided artificial ways of putting nature to the test (Findlen, 2006, p. 289). It extended the principles of the Baconian system of generating knowledge, and was further developed by Robert Boyle and Robert Hooke (ibid.) alongside their philosophies of knowledge. Zuidervaart (2013, p. 4) notes that the popularity of these new instruments such as air pumps, engines and generators grew quickly once collectors realised their significance to science and the economy and wanted to claim their own involvement in and understanding of these ground-breaking developments. This concept became all-pervading in the world of collecting, and transformed the concept of the cabinet as it moved into the eighteenth century. Botany was a new and rapidly developing science, which caught the attention of contemporary philosophers such as Rousseau, and as such, comfortably sat within the tradition of the cabinet of both natural and experimental philosophy.

By the early-eighteenth century this fresh approach meant that the tradition of collecting had both endured and developed with a new goal fit for the Enlightenment. Following the transition from wonder to science as a motivation, items were obtained and grouped in an attempt to satiate scientific concerns. In line with the assimilation and consolidation of scientific thought highlighted by Porter (2003, pp. 2-3), scholars strove to classify the world, and collecting many items together in one place assisted with investigation and understanding. This is visible in the historical record as a broadening out of the parameters of collection, and a change in focus or purpose; items were still prized for their novelty as they had been in earlier cabinets motivated by 'wonder', but this was increasingly supplanted by their scientific merit and modes by which they could be experienced were changing. Turner (1985, p. 220) notes that when eighteenth-century cabinets were formed by learned societies to aid the teaching of science, curiosity worked together with the discipline to aid the popularisation of scientific thought throughout Europe. In line with Daston and Park's theories (2001, pp. 303-328), wonder became the preserve of the wider masses, rather than the gentleman who was engaged in serious science.

The new trend meant that trade in scientific instruments boomed in London, with shopkeepers offering their own products as well as a range from other specialists in the capital (Turner, 2003, p. 527). The eventual destination for many of these pieces, purchased by educators and the wealthy alike, was the lecture demonstration - both public and private. Lecturers would travel

round the country giving demonstrations for which one could purchase a ticket, or would perform experiments with the elite's own equipment in private displays for entertainment. This was a significant mode of dissemination for the new and developing scientific knowledge (ibid., p. 521). Perhaps not wonder in its purest form, but certainly here we see evidence of artefacts and the cabinet being used for entertainment, not only among the general public, but also among the elite. The science which emerged from the new, deliberately scholarly cabinet was also wonderful in itself.

The concept of the wonderful remained within the collections of some, often for theatrical public spectacle. Some cabinets developed from private collections to public and professional demonstrations which were "scientific and commercial, educational and sensational" (Purinton, 2007, p. 250). Purinton (2007) shows how in some cases, this even developed into collection-based theatre; theatre which was occasionally scandalous, and which was used to entertain and shock a mainstream audience. It included Dr. James Graham's 'Temple of Health and Hymen' in Pall Mall in London, a newly branded collection of curiosities and abstract concepts present in the cabinet of experimental philosophy which, "combined drama, medicine, science, metaphysics, religion, music and sex with his medico-electrical apparatus" (ibid., p. 250). This was a new application which developed from the tradition of collecting, and took the concept to a new popular audience. While an extreme case, the issue of spectacle created a new context for science, and departed from the endeavour of enquiry and discovery.

Scientific instruments, however, were not the sole preserve of the eighteenth-century cabinet. The popularity of natural philosophy highlighted in chapter five embodied itself in the collections of professionals and gentleman amateurs alike. The cabinet of curiosity of the sixteenth and seventeenth centuries developed to include the mundane and ordinary alongside the curious and exotic for comparison and classification. Shells, fossils, insects, plants, minerals and countless other objects were collected *en masse* for study. John Fothergill's memoir states that,

> "For many years he was engaged in making a valuable collection of shells, corals, and other marine productions. Such a curiosity is very compatible with dignity of understanding, while it tends to the enlargement of natural knowledge, and presents to the contemplative beholder a compendious display of the wonders of creation!" (Thompson, 1782, pp. 39-40).

Chakrabarti (2012) has identified that, "this ethos of collecting was shaped by two related engagements; first was the importance of 'ocular demonstration' and the other was of observing the "phænomena of nature". Natural philosophy collections now sat within a much broader context of collection, which included science and theatre. The character of a collection

was largely dictated by its owner's interests, notions of personal identity and the material they could procure through their networks. Previously, exchange of curiosities had been predominantly based around patterns of gift-giving and systems of favour (Arnold, 2006, p. 20). The shift from aristocratic collectors to the *virtuosi*, gentlemen and mercantile classes necessitated a shift in this collection ideology. Commercial transactions increasingly became the dominant method of adding to a collection (Arnold, 2006, p. 20). The concept of a cabinet was open to anyone who could afford it. Trade was facilitated by the social networks built by membership of societies and the coffee house culture of the day, a web of knowledge and exchange.

No longer were collections and scientific interest the exclusive preserve of the aristocracy, they now appealed to a wider audience, and in a different way. As a social phenomenon, they had an array of functions, from scientific curiosity, to displays of wealth and status, to the theatrical tool of *entrepreneurs*. Increasing foreign travel and trade fuelled this fascination, and trade in all manner of artefacts and information was buoyant. It is true that the eighteenth century marked a more thoughtful approach to collection, however, there is little evidence that curiosities ceased to be included. Indeed, the nature of curiosity ranged, from the ridiculous and spectacular of two headed beasts, to the more understated curiosity about the intricacies of even the more mundane aspects of nature and processes. Peter Collinson, the London merchant noted for his introduction of exotic plants to Britain, also imported other natural curiosities including shells, curious stones and hummingbirds (Laird, 2015, pp. 24-241). Indeed, William Constable's eighteenth-century cabinet contained a vast array of geological specimens, not overtly wonderful, but scientifically curious.

Despite the increased solemnity in the purpose of cabinets, competition and jealousy was an issue for some collectors. In an article discussing happiness, possessions and desire in *The Adventurer*, a bi-weekly newspaper of the mid-eighteenth century, an author identified only as "T", asserted,

> "Men may be found, who are kept from sleep by the want of a shell particularly variegated; who are wasting their lives, in stratagems to obtain a book in a language which they do not understand; who pine with envy at the flowers of another man's parterre; who hover like vultures round the owner of a fossil in hopes to plunder his cabinet at his death; and who would not much regret to see a street in flames, if a box of medals might be scattered in the tumult" (T, 1753, p. 116).

The author continued on later pages,

> "There are men among those commonly reckoned the learned and the wise, who spare no stratagems to remove a competitor at an auction, who will sink the price of a rarity at the expence [*sic*] of truth, and whom it is not safe to trust alone in a library or cabinet" (T, 1753, p. 118)

The status of the cabinet as a social tool inspired a passion within collectors eager to own the latest introductions and the rarest specimens. Recent scholarship has started to characterise the collection as a means of identity building, which begins to explain the fervour with which many individuals accumulated objects. Swann (2001, p. 8) brings together various strands of collection-based scholarship to argue convincingly that a collection was always "steeped in ideology", and had a significant function in the process of fashioning the self. She states that "the role of collecting in the development of early modern natural philosophy was thus intrinsically social: the natural history collection became a technology with which diverse new social formations could be created" (ibid., p. 96), and also that each individual collector asserted a uniquely individual self within the social group (ibid.). Rather than a passive assemblage, the collection was a dynamic agent of the creation and demonstration of personal identity, and a social transformer which shaped eighteenth-century life. As part of this construct the ideology of the collected plant takes on a new dimension, both within the garden and within the cabinet collection.

PLANTS AS COLLECTIONS

As first highlighted in chapter two, plants are often acknowledged by scholars of cabinets and collections although rarely discussed in detail. Similarly, collection contexts and theories are rarely included in studies of plants and gardens. In his *Curiosity and Enlightenment*, MacGregor (2007, pp. 36-39) includes a short section in which he discusses gardens as cabinets, although mostly in the context of sixteenth-century Italy. If plants are considered as part of collections or even subject to the same ideological motivations, the associated structures of identity creation and social transformation will imbue them with a social agency hitherto little explored, but potentially vital to their understanding.

Most of those who participated in the serious study of botany held collections of plants and wider collections of natural history. The ethos of these more professionally based collections differed slightly from those of the gentleman *virtuosi*, as they were engaged in what may be considered as more professional natural philosophy. The *hortus siccus,* or collection of dried plants, was kept by botanists and natural philosophers as a reference tool for the advancement

of their work and study, often alongside wider collections of fossils, shells and other artefacts of natural history. Notable collectors included Sir Hans Sloane (1660-1753) (Hunter, 2012), Joseph Banks (1743-1820) (Chambers, 2015) and Richard Richardson (1663-1741) (Turner, 1835). The *hortus siccus* formed a significant part of a cabinet and a plant collection and is particularly relevant to this discussion, therefore it will be discussed in greater detail in the next chapter following an overview of the wider collections of our case studies.

One of the most prolific collectors of the early modern period was Sir Hans Sloane (1669-1753), a physician, naturalist and collector who built extensive social networks. Most of his original collection does not survive, having been sold off, burned, consumed by pests or separated from its labels, but the original catalogues do survive (Caygill, 2012, p. 120). The exact nature of the collection and its display is not yet fully understood, and awaits the full transcription of Sloane's catalogues (ibid., p. 131). It is known, however, that the collection included plant specimens; paintings, drawings and sketches of plants and animals; 50,000 books and manuscripts; paintings and portraits; over 12,000 boxes of dried seeds and fruits; antiquities from Egypt, Greece and Rome; fossils and minerals; shells and corals; around 10,000 animal specimens dried or preserved; anatomical rarities; cameos and gemstones; over 32,000 coins and medals; scientific instruments and more (Delbourgo, 2012, p. 11). The collections were arranged, not by cultural or geographic grouping, but by varieties of similar artefacts from around the world (ibid., p. 14). There is some debate as to whether Sloane collected selectively, or ravenously and for its own sake (Hunt, 2012, p. 190), but without documentation of his motives it is difficult to ascertain his selection criteria.

These issues of interpretation are not limited to Sloane; the pressed plant collections of professionals and those of the *virtuosi* often exhibited subtle differences, but remained rooted in similar ideologies. Many of the more academic collections, such as that of Joseph Banks, originated from first hand collection and study in the field. Others, such as that of Richard Richardson, now held in the Sloane herbarium and mentioned often in his correspondence, were vital tools dedicated to botanical research. James Petiver, the London-based apothecary, was facilitated in his quest for plants by networks all over the world, and published widely on medical botany (Chakrabarti, 2012, p. 74). Benedict (2012) tries to reconcile the differences in relation to her discussion of Sloane's collections,

> "The two roles of virtuoso and physician, however, also conflicted. Whereas a physician was a paid professional, a collector – that is, one who directed others to bring him things that he assembled into a collection – was an amateur enjoying the hobby of elite gentry" (Benedict, 2012, p. 34).

Here, Benedict identifies the conflict between the two roles held by Sloane, although the discussions above and in the previous chapter have noted the blurring of the lines between the amateur natural philosopher or collector, and the professional. Collections of both types, academic and collector-based, may have looked the same, but it is the context in which they were produced which provides the subtle distinction.

As Benedict observes, the split is not clear in Sloane's own collections, existing on the transition to the empirical objectives of the new science. Indeed, he was mocked by some contemporaries for collecting some of his more exotic curiosities (Delbourgo, 2012, p. 17). The eclectic nature of his collections brought to mind a *virtuoso*, but Sloane found everything collectable, not simply the immediately interesting and his collection was vast (Benedict, 2012, p. 35). Chakrabarti (2012, p. 71) suggests that Sloane's collections have generally been seen in the context of the European scientific elite, and in congruence with European ideas of observation as science rather than for wonder and amusement. As one of the finest collections of the seventeenth and early-eighteenth centuries, and one of the best documented, it is advantageous to provide a brief overview of the collection here.

The interconnected networks of the *virtuosi* around the world were aware of Sloane's collections. Delbourgo (2012, pp. 16-17) has even suggested that the habit of collectors linking with and gifting curiosities to Sloane was an attempt to gain their own prestige by association with a collection of renown. In addition to status, the collection could be used for research by those admitted for viewing. In Albin's *A Natural History of Birds*, for example, it is noted by the author that "the Hen, which I saw at Sir Hans Sloane's, is more darker all over the Body, Wings and Tail" (Albin, 1734, p. 9). Sloane subscribed to the volume, in addition to Albin's *Natural History of English Insects* (Albin, 1720), and *A Natural History of Spiders and other Curious Insects* (Albin, 1736).

It was perhaps prudent of Sloane to offer his collections for research assistance, as he is not credited with using much of it for knowledge advancement himself. Levine (1991, p. 88) goes so far as to label him a "dilettante collector", and "certainly no philosopher". His primary occupation was clearly as a physician, and with further time spent collecting, making connections and contributing to the operation of bodies such as the Royal Society, he would not have enjoyed the leisure of many of the gentry to study and document his collection. Jill Cook (2012) has argued, however, that he was not simply a *virtuoso* collector, and did contribute significantly to the advancement of knowledge of the history of the earth, geology and palaeontology through his work on the fossil remains in the collections, particularly of elephants on which he published two papers in the *Philosophical Transactions* which recognise the idea of the fossil as preserved remains within a changing earth face (ibid., p. 165). This in turn, Cook suggests, contributed to a change in the mindset of academics, to a state in which

the timescale set out by the Bible may not be the only one possible. Sloane's collections, therefore, supported scholarship and the development of knowledge.

A contemporary and friend of Sloane, but with a collection of significantly different character was Mary Capel Somerset, the Duchess of Beaufort. Chapters four and five outlined her extensive plant collections and early scientific approach to propagation and cultivation, but there is no evidence that Somerset kept her plant collections as part of a wider cabinet. Her main focus was seemingly her garden and the classification of her plants, whether as living specimens, dried specimens or paintings. With regard to the composition of her plant collection, the standard form of contemporary and later collections is apparent, with a wide range of specimens gathered and later classified. Although often noted primarily as a grower of exotics who could successfully cultivate plants from around the globe, the duchess also had an interest in native plants and subsidised botanising trips in Britain (Chambers, 1997, p. 54). She had a desire to reconcile the new plants in her garden to existing taxonomies and earlier accounts and descriptions of plants (ibid., p. 56), echoing the notion of comparison in the cabinet of curiosities discussed above. Indeed, one of the Sloane manuscripts referenced by Chambers (ibid.), makes it clear that the garden aimed at the ethos of a botanical garden, making collections of plants of the same genus, including those of the genus which are not rare. Somerset's is one of the earliest surviving case studies which demonstrates a scientific method to plant collecting. Her approach is similar to that of her contemporaries to their natural history collections, an eclectic mix of objects of interest, with a structure beginning to be applied but yet to take on the systematic classification which characterised collections of the Enlightenment. Her approach to plant collecting and growth paved the way for later collectors, who were further inspired by empirical developments in science.

Dr John Fothergill, whose garden at Upton in Essex was introduced in chapter three, held collections of natural history. In a letter to Carl Linnaeus in 1772, James Lee described Fothergill's collections and subsequent contributions to the promotion of natural history,

> "Doctor John Fothergill is one of the greatest promoters of Natural History (particularly botany) that we have in this country, he is a physician of the first Rank in the Metropolis of London, a man of Great Learning, & possessed of Evry Good quality that constituts the Great & wise man. He is posesed of a most Elegant Garden with a fine collection of curious plants. He collects evry part of Natural History from all parts of the Globe, and would very willingly communicat any thing to you that he has, worthy of your acceptance" (Linnaean Society, 1772a).

Equally, Joseph Banks and Daniel Solander, quoted, in a footnote in Fothergill's memoir, are clear that his garden was his greatest collection.

> "Of this the large collections he made in Natural History bear sufficient testimony, particularly in shells, corals and insects. But, above all, the remembrance of his botanic garden at Upton will ever be fresh in the minds of all lovers of that science" Banks and Solander in (Thompson, 1782, p. 37).

This suggests his plant collection was indeed extensive, as is recorded by Lettsom,

> "…next to the Dutchess of Portland, he had the best cabinet of Shells in the kingdom; his collection of Ores and Minerals, dug out of different parts of the earth, were more distinguished for their rarity than their number. Of Reptiles and Animals, the gratitude of those he had patronized furnished him with a curious variety: in the same manner he became possessed of an elegant cabinet of Insects…His Corals [collection]… was the foremost in Europe" (1786, pp. 54-55)

Very little further information is known about Fothergill's curiosity collection other than this note in passing, and that it was left to William Hunter after his death and became part of the Hunterian Collection (DeLacy, 2004). His memoir recorded that,

> "For many years he was engaged in making a valuable collection of shells, corals, and other marine productions. Such a curiosity is very compatible with dignity and understanding, while it tends to the enlargement of natural knowledge, and presents to the contemplative beholder a compendious display of the wonders of creation!" (Thompson, 1782, p. 40).

So while there is little evidence of Fothergill's actual collection, we are left in no doubt as to the intention of the assemblage itself. Fothergill was aiming to further knowledge of nature, and also to bestow the wonder of creation on those who viewed it. His attempts to experiment and to share knowledge and plants with his contemporaries around the world which were discussed in chapter five mark him out a as philanthropist of knowledge and the fruits of his collections. His garden was referred to by Banks and Solander, two of the most eminent botanists of the day, as a botanical garden, and part of a scientific endeavour. Fothergill's plant collections, both indoor and outdoor, were clearly designed for scholarship in addition to enjoyment.

The fact that the collection can be so significant and yet leave no trace highlights one of the main obstacles to a study such as this, namely, the lack of evidence for complete collections. In many instances the evidence is limited to a comment in a subsequent publication if a catalogue or physical collection has not survived. If the individual was not noted in a publication before or after death, then a collection may leave no trace at all. Such a fate unfortunately befell the collections of the Duchess of Portland.

Margaret Cavendish Bentinck, the Duchess of Portland (1715 – 1785), was a particularly prolific collector. Her collections were extensive and impressive, and her knowledge of them was revered. Stott (2013, p. 15) has even claimed that the natural history specimens were more numerous and more diverse than the Sloane collection and Hall (2016, p. 59) notes that the collection always had the character of a cabinet of curiosities. Laird (2015, pp. 336-337) has endorsed the importance of Bentinck's collections, in addition to highlighting her scholarly role in their classification. Rather than the items being a curious diversion for the duchess, Laird stresses her strict methodology and mastery of their systematic arrangement, noting that both Richard Pulteney and Henry Seymer turned to her when in difficulties with Linnaean shell taxonomy (Laird, 2015, p. 337). Laird (ibid., p. 267) echoes Allen's (1976) assertion that the duchess's natural history collections were more significant than the British Museum, as a place of study of plants and animals. In a letter of 1766 J.J. Rousseau wrote,

> "…none of nature's products is foreign to you. You know how to classify fossils, minerals, shells, how to cultivate plants, how to feed birds, what is there that you do not nourish? I know a somewhat savage animal that would with the greatest pleasure live in your menagerie, in expectation of the honour of being admitted to one of your cabinets as a mummy at a later day" (Calmann 1977, p. 83).

The duchess's collection indeed contained an extensive array of items of natural philosophy. On her death, the sale of her collection included 4000 items and took 38 days to complete (see Skinner and Co., 1786). The items were extremely varied, including shells, corals, minerals, fossils, crystals, snuff boxes, bird nests and eggs, coins and medals, items from China, Japan and India, insects, prints and drawings, miniatures, jewels, models and rare antiquities. The catalogue noted that,

> "In the articles of *Virtu* it contains no inconsiderable Part of her most Valuable Collection; but in *Natural History* every subject is inserted she had with so much Pains and Treasure accumulated. And here it will appear, that all the Three Kingdoms of Nature, the *Animal, Vegetable*, and *Fossil*, were comprehended in her Researches" (Skinner and Co., 1786, p. iii).

Clearly, the duchess's live plant collections were part of the same collection impulse, but were not sold along with the remainder of the portable curiosities. It is also uncertain what happened to the animal collection, which was extensive[32]. The dried plant specimens were sold off,

[32] Mrs Philip Lybbe Powys recounted a visit to Bulstrode in 1769, in which she recalled, "The menagerie, I had heard, was the finest in England, but in that I was disappointed, as the spot is by no means calculated to show off the many beautiful birds it contains, of which there was a great variety, as a curassoa, goon, crown-bird, stork, black and red game, bustards, red-legg'd partridges, silver, gold, pied pheasants, one, what is reckoned ex-ceedingly curious, the peacock-pheasant. The aviary, too, is a most

however, including seeds, woods, fruits, lichens, fungi, mosses, gums, leaves, cones, sea-weeds, dried plants and "a curious specimen of the Double Cocoa-nut"[33] (Skinner and Co., 1786, p. 66). She had even kept seaweeds and sea creatures in basins of sea water (Laird, 2015, p. 293).

In the hope of acquiring further items of natural philosophical interest the duchess had contributed to the costs of exploratory expeditions, including Captain Cook's voyage of 1768 which was attended by Joseph Banks (Stott, 2013, p. 37). She also engaged the services of the eminent botanist Daniel Solander, who began cataloguing her collection in 1766 (ibid., p. 42). As Solander was mainly employed with cataloguing Sloane's collections at the British Museum, the duchess employed the Reverend John Lightfoot to continue her cataloguing in 1767. Lightfoot was an expert in conchology and botany, and provided instruction on botany and on botanising trips in addition to evenings of philosophical speculations (ibid.).

Such was the popularity and extent of the duchess's collections and collecting networks that Stott (ibid., p. 19) suggests that it moved beyond a cabinet of curiosity, into "a kind of university, a philosophical salon, a group of people who could discuss objects in her collection in terms that embraced the most sophisticated and controversial natural philosophical ideas of the day". In addition to her artistic friends who included the actor, playwright and producer David Garrick, and portrait painter Sir Joshua Reynolds, she entertained prominent horticultural minds including Sir Hans Sloane, Philip Miller, Sir Joseph Banks, William Curtis, Dr Richard Meade, Lord Bute, George Pulteney and Peter Collinson (Festing, 1986, p. 195). The scientists respected her knowledge and discourse, and extended similar invitations to her; following his return from the Endeavour voyage Joseph Banks invited the duchess and her friend Mrs Delany to see the fruits of his travels at his residence (Hayden, 1980, p. 114).

Richard Richardson, discussed in the previous chapter as both a learned professional and wealthy patron of horticulturists and botanists of less means, was also an avid collector. His collection contained mainly items related to his primary interests of natural history and botany. In July of 1702 he wrote to Hans Sloane,

> "...in order to a collection of natural raritys: 'tis very likely you have duplicats of severall curiositys often brought you to be sold. When that happens, doe me the favoure to be a purchaser for me; and I will very thankfully disburse what-ever you lay out upon my

beautiful collection of smaller birds — tumblers, waxbills, yellow and bloom paraquets, Java sparrows, Loretta blue birds, Virginia nightingales, and two widow-birds, or, as Edward calls them, ' red- breasted long-twit'd finches" (Powys, 1899, p. 121)

[33] This specimen later turned up in the sale catalogue of Monsieur de Callone in France, noted as being purchased from the Duchess of Portland's collection (Humphrey, 1797, p. 78)

> account. Any thing in Naturall History cannot come wrong; but in medals I doe not concern myself" (Turner, 1835, pp. 57-58).

Due to the number of Richardson's letters and the variety of correspondents, it is possible to gain an insight into the large number of plants and curiosities sent between interested parties, and it is interesting to note how commonplace this was as a means of sharing and communication. Many letters mention the transfer of items, often as an aside whilst opening or signing off. A letter from Richardson to Ralph Thoresby in July of 1702 noted as an opening that,

> "I had taken care of Mr. Lhwyd's present to you, if I had not received your further directions… I daily expect Mr. Bobart's orders for a fresh supply of those plants I sent him in May; the season then being soe untoward for planting, that I feare very few of them are now alive. If I heare nothing from him shortly, I shall desire him to send me the formed stones I had front he Museum" (Turner, 1835, p. 65).

Within the letters it is possible to see plants as a major item of curiosity, something to be expected given Richardson's significant botanical bent. Consistent with the collection habits of the gentry collectors above but for which there is less written evidence, Richardson's letters champion native plants in addition to exotics. In a letter of September 1702 Mr Sutherland wrote to Richardson that,

> "When the Bryonia nigra seeds are ready, I request ye would gather some for me, and also of the Frangula, if it growes with yow, and any other seeds of your plantae indiginae ye think I may want" (Turner, 1835, p. 71).

Similarly, a letter of June 1706 from Adam Buddle, the botanist and cleric, was candid on the issue,

> "You used to talk of sending your grasses and mosses to me; and, if you do yet intend it, I do promise to fix their names and make what additions I can to them. My mind is as intent upon plants as ever: nay, I think my ardour increases; for having the compleating of my English collection always in view makes me passionately bent upon it, that I may live to see all of our English plants hitherto discovered; and I believe they are almost all discovered" (Turner, 1835, p. 88).

The passion Buddle had for native plants is unsurprising for a botanist, but it is notable that this extends throughout a significant proportion of the great number of plant collectors in the country at the time, both professional and amateur. Moving in similar academic circles, botanical practices spread, and eager to be seen as men and women of serious natural history,

the collectors followed common scientific and botanical practices of collecting from the whole of nature.

John Stuart, third Earl of Bute considered himself as a serious scholar, and was a great collector, particularly of scientific instruments. In addition to his living plant collections and impressive array of *hortus siccus* which will be discussed in the next chapter, Stuart also kept an extensive collection of minerals and a library of botanical and natural historical works (Turner, 1967, pp. 214-215). Miller (1988, p. 223) has identified that Stuart's enthusiasm for minerals and fossils seems to date from the late 1760s and early 1770s, when he was withdrawing from public office and took a tour of Europe. The collections were so numerous that on his death they took sixteen days to sell. The catalogue which documented the sale of Stuart's optical, mathematical and philosophical instruments over three days in February 1793 outlined the extensive content of the collection including drawing instruments, a large armillary sphere, air pumps, electrical machines, microscopes, telescopes, barometers, thermometers and magnets (Turner 1967). Like William Constable, Stuart had a laboratory at his Luton Hoo residence, the contents of which were sold off in a separate sale and included retorts and glass vessels, crucibles, furnaces and utensils used in chemical experiments, metal ores, minerals and an air pump (ibid., pp. 217-218). In his *Memoirs of a Traveller*, Louis Dutens, the French traveller and writer observed that Stuart's cabinet of mathematical instruments and astronomical and philosophical apparatus, "may be reckoned the most complete of the kind in Europe" (Dutens, 1806, p. 114).

The case studies present a fragmentary picture of natural philosophy and associated plant collecting, and show a variety of approaches informed by individual motivation and circumstance which changed over time, corresponding to broader trends in collecting, and by extension, scientific method. The social advantages of an extensive collection were only gained, however, when it was shared, by correspondence of knowledge or by welcoming others to engage with it, to learn from it, and to be impressed.

VISITING COLLECTIONS

Visits to cabinets and collections were a central feature of the grand tour through Europe (Swann, 2001, p. 27). Social links were formed, there was prestige to be had in 'collecting' a good number of visits to collections, and a host's reputation was enhanced by high profile visitors. In the seventeenth century, Robert Hubert invited the paying London public to view his collection, and offered specialist exhibits on some days of the week (ibid., p. 4). Sloane certainly welcomed certain guests to view his collections, guiding them through the rooms before taking coffee with them and discussing items of interest (Delbourgo, 2012, p. 12). Caygill (2012, pp. 133-134) identifies accounts of a number of visitors proceeding through Sloane's extensive collection rooms viewing specimens in cabinets and open shelves.

In *The Adventures of George Maitland Esq*., the author used the cabinet as a comparison of enthusiastic fervour, noting, "our apartments were surrounded, like a cabinet of curiosities, with the favours daily bestowed upon us" (Anon., 1786, p. 110). In the *Life of Samuel Johnson*, James Boswell recounted two visits to cabinets in 1775, one to the King's cabinet in France which was "very neat, not, perhaps, perfect" (Boswell, 1792, p. 250) and the cabinet of the Prince of Condé in Chantilly, where he noted, "the cabinet seems well stocked: what I remember was, the jaws of a hippopotamus, and a young hippopotamus preserved, which, however, is so small that I doubt its reality" (ibid., p. 262).

Visitors, however, were not always respectful. In September 1773 Ashton Lever published an advertisement in the *Manchester Journal* which noted,

> "This is to inform the Publick, that being tired out with the insolence of the common People whom I hav hitherto indulged with a sight of my museum I am now come to the Resolution of refusing Admittance to the lower Classes except they come provided with a Ticket from some Gentleman or Lady of my Acquaintance. They will not be admitted during the time of Gentlemen and Ladies being in the Museum" (*Manchester Journal*, 18 September 1773 quoted in MacGregor, 2015).

Following his consternation, however, Lever clearly resolved to embrace his visitors more widely, moving the collection to Leicester Square in London in 1774 and opening it to paying visitors. The popularity of collection visiting had led to the formation of a museum as a visitor attraction. Other collections were just as prolific. Dixon (2015, p. iv) has suggested that a visit to Banks' collections at his London home was as of much importance to natural historians as a visit to the Natural History Museum itself. In a letter dated the 12th April, but with no given year, John Lightfoot, reverend and botanist wrote to the Duchess of Portland that he was meeting up with a Mr Pennant, "in order to see Mr Tunstall's Collection, the Bird-Room at the Museum &c" (UNMSC PwE20, n.d.).This is clearly a reference to one scholar visiting the collections of another, and a link between Constable's brother in law and Lightfoot. The connections between collectors of the period and visits for mutual study were commonplace.

Cabinets for theatre and cabinets for study diverged in the eighteenth-century, although this did not mean that those for study were no longer a curiosity. Costa (2002) notes that curiosity sometimes had negative connotations, being associated with luxury and a morally ambiguous commercial society, but that it was also considered a praiseworthy and valuable endeavour. She argues that meetings of the Royal Society were concerned with the promotion of inquiry, education, polite discourse and entertainment. Noting that "most of the specimens presented at the meetings shared the exotic and/or rare attributes that recent scholarship has shown to be typical of the objects traditionally displayed in a cabinet of curiosities" (ibid., p. 151). Plants

were regularly discussed at these meetings, particularly exotics. Thus, despite the newly perceived vulgarity and quest for knowledge, objects and exotics remained as curios for the elite in the eighteenth century, although many gentlemen may have been loathed to admit it.

WILLIAM CONSTABLE'S CABINET

FIGURE 23: A SELECTION OF ITEMS FROM CONSTABLE'S CABINET OF CURIOSITIES, ON DISPLAY AT BURTON CONSTABLE (AUTHOR).

Following William Constable's death in 1791 the contents of his curiosity cabinet were stored at Burton Constable rather than being sold off, which was the most usual action on the death of a collector. The assemblage now forms an excellent record of, and a fascinating insight into, the interests and motives of an eighteenth-century collector. The collection, like those described above, is eclectic, although no original or modern catalogue exists to describe the true extent of the artefacts; this would be a useful project for future study. Scientific instruments form a large part of the collection, and also natural curiosities including stuffed animals and birds, and preserved creatures, including a small lizard preserved in spirits which Constable bought as the skeleton of a dragon. Fossils, shells and geological specimens are represented in abundance, as well as a small collection of seeds. Coins, medals and sulphur casts also feature heavily.

Published material includes a brief overview of the collection (Hall and Hall (1991, pp. 40-52) which is the most comprehensive study to date. A study of the casts of medals, ancient coins and gems which Constable purchased from the jeweller William Dugood in 1760 has been published by Connell (2009). Part of the collection was obtained from the collection of antiquarian Ralph Thoresby (1658-1725), some years after his death in 1769, which has been outlined by Connell and Boyd (1998, pp. 37-39). The Thoresby items are mainly zoological and cultural specimens, a surviving list included the claw of a great lobster, the foot of a great bear, the skin of a rattle snake, a number of swords and shields, various types of shoe, a piece of Queen Elizabeth's walking staff inlaid with ivory, a multiplication table and "one of those Brass Instruments found near Bramham Moor" (ibid.).

The cabinet collection is not currently housed in its original location. Hall (1992, p. 45) suggests that although the location of the cabinet during Constable's time is not known with certainty, it was probably near to the long gallery which housed Constable's library. Presumably Hall was not aware of the house plan shown in figure 22 which details the museum and experiment room on the ground floor of the house, in addition to the room labelled 'Mr Constable's Cabinet' near the back stairs (the long gallery is upstairs on the opposite south side of the house). It is notable that the period when the museum room was functioning, from the late 1750s to the early 1770s, correlates exactly with the dates of Constable's early stove and stove garden, indicating a short but intense period of collecting that was represented both within and outside the confines of the house. However, it is not known where the cabinet was relocated to following the replacement of the museum room by a chapel in the mid-1770s. It is even possible that some of the collection was housed in Constable's fashionable house in London, about which even less is known. It is known that Marmaduke Tunstall, Constable's half-brother, kept his own collection at his London home until 1780 or 1781 (Fox, 1827). As was usual for collections of the time, it is likely that other interested parties were able to view Constable's collection, both for their own interest, and to promote the status of the collector. No records exist at Burton Constable to support this, although the housing of part of the collection in London would

facilitate its exhibition to a wider audience. Burton Constable Hall near Hull was far less accessible to the interested gentlemen of the Royal Society of London, than a house in the capital.

While Constable's collections were more akin to a cabinet of natural and experimental philosophy, rather than curiosity, Hall notes that, "his background and natural inclinations gave him the old traditional approach of an enthusiastic and discerning collector in whose mind aesthetic and scientific aspirations were inextricably linked" (Hall 1992:17). The eclectic nature of many of the collected items in addition to the abundance of scientific instruments clearly indicate that he was attracted to the fascinating and exotic for their novelty, while also wishing to further his scholarship and knowledge.

There is little mention of the collection as a whole in any of Constable's correspondence, apart from one mention in a letter from his agent in London, John Dunn:

> "We Come this moment from Prince Charles's Cabinet: It gave me Singular pleasure to point out to Mr Tunstall and others the many things the Same, or I may say worse, than at Burton"
>
> "His Stoves, Pineapples, Plants etc are Scarce worth notice".
>
> (ERRO DDCC/145/2, n.d.)

The visiting and viewing of others' cabinets was commonplace, and it is not surprising that they were compared with one's own. Exactly which Prince Charles the letter refers to is not certain, although Prince Charles Alexander of Lorraine, an Austrian General and Soldier, is known to have held a cabinet of natural history (Raat, 2010, p. 303; De Calonne, 1797, p. iv), and Dunn mentions a journey to Lorraine in the same letter. Dunn notes seeing dried birds and mathematical instruments (ERRO DDCC/145/2, n.d.), both known to have been kept by the Prince (Raat, 2010, p. 303). There is no detailed study of the cabinet of Charles of Lorraine as his collections were dispersed in sales after his death, but like Constable, he is known to have enjoyed and collected culture, art and furniture in addition to natural curiosities (Baarsen, 2005).

Dunn's reference to the stoves and pineapples puts them within the same frame of reference as the collections inside the house. It suggests that all were on display to visitors and considered as part of the same experimental science. Whether Prince Charles' cabinet was in poor form, or whether Constable's collection was great enough to surpass that of minor royalty is uncertain due to the lack of evidence for the former. It is clear, however, that Constable and his

contemporaries saw his cabinet and stove as a cultural artefact to be compared, contrasted and to be proud of, and that the collections at Burton Constable were of significant quality.

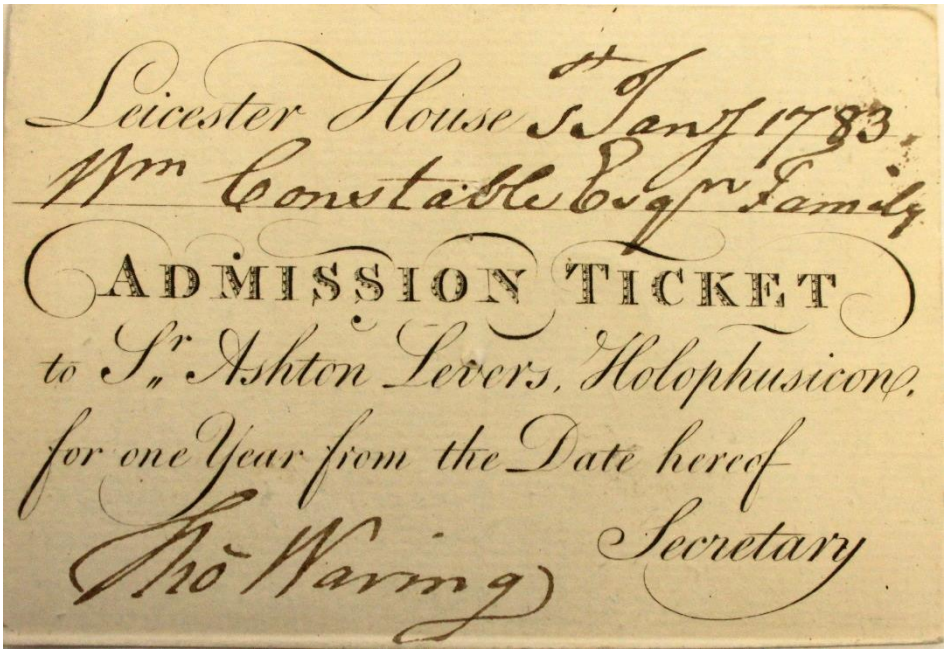


FIGURE 24: AN ADMISSION TICKET TO THE HOLOPHUSICON, THE MUSEUM OF ASHTON LEVER IN LEICESTER SQUARE (BURTON CONSTABLE HALL).

Constable is also known to have visited cabinets himself and to have encouraged others to do so. In 1761 he wrote to his stepmother to advise on the education of his half-brother Marmaduke, suggesting that if she sent him travelling, "he might during the progress of the year see all the best cabinets relating to the study of natural philosophy" (ERRO DDCC/144/9, 1761). A receipt of admission to Ashton Lever's spectacular museum and collection of natural curiosities in Leicester Square, also known as the *Holophusicon*, confirms that in 1783, towards the end of his life and in failing health, Constable still maintained an interest in visiting cabinets and viewing curiosities (figures 24 and 25).

The extensive purchases of scientific instruments are of interest in terms of contextualising the collections of William Constable. These instruments were found scattered around the Hall at Burton Constable and studied by Elisabeth Hall in her MPhil thesis (Hall, 1992), during which she investigated the purpose of the instruments and their provenance. Much of the information cited in the thesis derives from Constable's missing commonplace notebooks, therefore we are largely reliant on her observations and the surviving apparatus in the collection for an understanding of this assemblage. It is these instruments which place Constable's collections into the class of the cabinet of experimental philosophy, as defined by Turner (1985).

FIGURE 25: THE LEVERIAN MUSEUM, OR HOLOPHUSICON. A MUSEUM OPEN TO PAYING VISITORS IN LONDON AT THE END OF THE EIGHTEENTH CENTURY. THE WATERCOLOUR SHOWS THE COLLECTION AS IT WAS IN THE 1780S WHEN WILLIAM CONSTABLE VISITED. AFTER (DETOURS DES MONDES, 2005)

At the beginning of Constable's interest in collecting in the late 1750s, his focus was on electrostatic equipment, perhaps the motivation behind his experiment room. He purchased various machines for creating static electricity and other associated equipment of varying design and quality (Hall, 1992, pp. 192-195). At the same time he also indulged an interest in astronomy, purchasing a number of telescopes, as well as various different microscopes (ibid., pp. 196-197). Hall (ibid., p. 211) suggests that Constable's intention in collecting instruments seems to be for interest and curiosity, rather than for the discovery and publication of new ideas. She suggests that being made from brass and mahogany, the instruments had a specific display value and were designed to fit well into the house and collections of a country gentleman (ibid., p. 214). This is undoubtedly true, although functional instruments were also made of quality materials to fit the desires of the owner and the materials were not uncommon in instruments of the time, lending themselves well to fine detail and strength, and so there is no reason to believe that Constable's were intended for ornament rather than experiment.

The instruments were certainly functional. Constable had links with Yorkshireman John Arden, a lecturer in experimental philosophy who William employed as a demonstrator for his

experiments (Roberts, 1998, p. 17), and who has been described as being "of particular importance among the purveyors of mechanical principles" (Buchwald & Fox, 2013, p. 315). Arden travelled the country giving lectures and performances of his experiments, and eventually settled in Bath. His son James Arden produced a published overview of his father's lecture series, including information on natural philosophy, chemistry, electricity, mechanics, geography, astronomy, hydrostatics, pneumatics and optics (Arden, 1774). He noted in the introduction that,

> "The Design of this Course of Experimental Philosophy, being to demonstrate in as familiar and natural a Manner as the Nature of the Subject will admit, all those Principles by which the Universe is governed, regulated, and continued, and account for the various Phenomena, or appearances of Nature, which arise therein" (Arden, 1774, p. 4)

While the scientific equipment may seem divorced from the natural phenomena in Constable's collections, his link with Arden and his experimental philosophy suggests that this too was aspiring to the same goal, an understanding of the natural world. This demonstrated link between a gentleman's pursuit of scientific knowledge and the new phenomenon of the 'lecture demonstration' directly reflects Turner's (2008) observations on the diffusion of scientific knowledge.

Constable was by no means unique in being inspired to obtain his own equipment as a result of attendance at public and private demonstrations. Many others obtained similar apparatus, including John Stuart, the third Earl of Bute, who held an extensive collection of apparatus, including that for astronomy (Reid, 1982) in addition to his botanical and natural history collections. The earl's collections and interests were at least as extensive as Constable's. In 1780 Tiberius Cavallo dedicated his *Essay on Medical Electricity* (Cavallo, 1780) to Bute. Similarly, the third Earl of Egremont had a laboratory of scientific equipment including electrical, pneumatic and astronomical at Petworth House (McCann, 1983).

Some of Constable's instruments came from local craftsmen, and some were purchased in London. At least sixteen different instruments were purchased from Benjamin Cole of London, many concerned with pneumatics, including an air pump with vacuum jars and pressure vessels. He also ordered a set of musical glasses which could be tuned by water to achieve a musical note (Hall, 1992, p. 201). With regard to chemistry, the cabinet includes various glass bottles and jars with as yet untested substances within, observed at Burton Constable, which may have been part of Constable's experiments. Overall, the experiments evidenced by Constable's equipment clearly reflect the list of commonly executed public demonstrations (Turner, 2003, p. 521), including mechanics, hydrostatics, pneumatics, electricity and

chemistry. Hall (1992, pp. 204-205) has noted repeat orders of chemicals, suggesting that Constable was actually carrying out the experiments. She also notes, however, that his (now missing) notebooks contain various instructions on how to carry out experiments, but very little on the actualities of this, or on the results (ibid., p. 207). Her overall impression "is that the physics apparatus is well preserved but giving some indication of use" (ibid., p. 208).

The cabinet of experimental philosophy represents a period in which science was carried out in the domestic sphere, often within a purpose-built facility within a gentleman's home. For Constable, the collection of equipment appears to spring from the same impulse to collect the curious and intriguing as the rest of his artefact, natural history and plant collections. The science was more abstract, but its collection was motivated by the same goal. Indeed, Turner has noted that,

> "What occurred in Europe during the eighteenth century was, quite simply, an outburst of interest in the working of the natural world, as revealed by means of experimental apparatus" (Turner, 2003, p. 522)

The cabinet, scientific equipment and plant collections, therefore, cannot be studied in isolation. They were independent components of a common goal: to further understand the world, its objects, forces and processes. The survival of much of the collection at Burton Constable and the evidence for that which has been lost presents a fascinating picture of investment and effort aimed at generating a greater understanding of the world. It provides a lens through which we can view and understand how plant cultivation was so intimately tied up with cabinet collecting.

BUILDING CONSTABLE'S COLLECTIONS

One of the ways in which we can begin to understand the parity between Constable's plants and the rest of his cabinet is by considering their initial procurement and their treatment once at Burton Constable. William collected primarily through his contacts in London, Italy and Brussels. He also had local connections, particularly with nurseries, and obtained fifty-five curiosity items from the collection of Ralph Thoresby of Leeds in 1769 (Connell & Boyd, 1998) as outlined above. It is thought that the Thoresby items came to Constable through an intermediary, Dr John Burton.

A separate enabler of the collection, John Dunn was Constable's primary agent in London who handled most of his business affairs and sent specimens to Hull. Many itemised vouchers exist from Dunn, who variously sent items of interest and more commonplace necessities to Constable. The correspondence records Dunn sending a wide variety of plants, both exotic and

commonplace, for the gardens until his death in 1778. These will be discussed further in relation to the Burton Constable plant collections in chapter seven. Dunn also sourced Constable's scientific instruments from London (Hall, 1992, p. 210). A further extensive provider to Constable's natural history collections was Emanuel Mendes da Costa (1717-91), a naturalist and dealer working from London, with a particular interest in shells and fossils. Constable also used a second agent in London, the Catholic priest John Shepperd, who assisted particularly in the purchase of William Dugood's collection of casts in 1760 (Connell, 2009).

A fascinating exchange of letters exists from Constable's dealings with Emanuel Mendes da Costa (1717-1791) in the early 1760s. Da Costa became secretary of the Royal Society in 1763, until he was found to be embezzling funds to the tune of £1500 and was subsequently imprisoned (Cantor, 2001). Da Costa was connected to many of the *virtuosi* in Europe, was an avid collector, and also an ardent enabler of collection for others. He dealt in natural history, including shells, fossils and geological specimens. Cantor (2001, p. 586) has highlighted the tenacity of Da Costa, who, despite a modest background, gained a foothold in science by creating a network of contacts including dukes and duchesses, clergymen, Fellows of the Royal Society and eminent scientists.

Da Costa first attended the Royal Society in 1745 as a guest of Peter Collinson, the botanist and gardener, and was elected to the Society by 1747. During a spell in prison for the aforementioned embezzlement, he completed a significant amount of work on his first publication, the *Natural History of Fossils* (1757). Da Costa divided opinion among his peers; some loved him and espoused his generosity and knowledge, while others found him terrible company and dishonest to boot. It is unknown how exactly Constable and Da Costa first became acquainted; it was perhaps inevitable given Constable's leanings and Da Costa's inclination to connect himself with as wide a network of potential clients as possible. However, the most likely channel of patronage was through John Needham, Constable's college tutor who had existing connections to Da Costa.

The correspondence with Da Costa began amicably, Da Costa extolling the virtues of collecting and flattering Constable's methods and tastes. In a letter from July 1760, he wrote;

> "You seem now sir to have bent your mind to the study of Natural History, I applaud you greatly, for besides its being noble, it is inexhaustible, the productions of nature are infinite; your mind will be filled with wonder each object you contemplate: the minutest plant or Insect, the inanimate stone or mineral, will afford you delight" (ERRO DDCC/145/1, 1 July 1760)

He sent interesting items such as 'sea plants', but soon attempted to bend Constable's collecting ideology, in order to sell him more material in November of the same year.

> "Science demands common and usefull as well as beautiful and rare, to found ones ideas upon; as Grammar demands the simple letters to form the Language: and as you Sir, seen to persue Science, and not the title of Vertuoso or Collector only, you really cannot make a progress till you have attained the rudiments of it" (ERRO DDCC/145/1, November 1760)

Before long the correspondence became strained. Constable's half of the correspondence is missing, but the correspondence suggests he questioned Da Costa on his methods and on his prices. Da Costa retorted;

> "You mistake me, I do not insist on the Collecting fashionably, but think as you do of collecting scientifically"

> "the beautifullest shells when easy to be got, are of easy price; the famous Wentletrap[34] owes its surprizing or exorbitant price to its extreme rarity" (ERRO DDCC/145/1, January 1761)

The correspondence came to an end shortly after Da Costa accused Constable of wrapping items incorrectly when he returned them to him in London and causing their breakage. He asked for payment for the damaged items but evidently never received it. There follows another letter expressing concern that he had not heard from Constable, and, presumably fearing that he may lose him as a customer, offering to recommend him as a member of the Royal Society (ERRO DDCC/145/2, July 1761).

The letters are an insight into the relationships between collectors and dealers, and the processes by which disparate assemblages were formed. Additionally, they provide valuable insights into Constable's motivations. Da Costa's flattery of Constable by reassuring him that he knows he collects scientifically, rather than fashionably, suggests that Constable in particular, but also presumably other gentlemen collectors, thought of themselves as scientists, and not simply *virtuosi* collectors of novelty. In a letter of July 1760, Da Costa mused,

> "Your shells, (as all the English are,) will be coarse: but yet a Collection of English shells, will be not only Scientific, but Amusing: the vitious tastes of liking only Exotics prevails as much among vertuosi, as people of fashion" (ERRO DDCC/145/1, 1 July 1760)

[34] A distinctive type of shell which has extremely defined ridges

The correspondence between the two demonstrates that collectors were encouraged, or wished, to collect even the most mundane examples in order to build a comprehensive collection, rather than simply collecting the exotic and beautiful, but that many often leaned towards the exotic and fanciful nonetheless.

Further correspondence on the subject of the Burton Constable collection suggests that its composition was motivated by Constable's interests, while its contents were dictated by availability. Constable identified areas of interest including natural history, and made contacts in the south where artefacts were available. The shape of the collection then followed the availability of goods, and the business and marketing skills of Da Costa as a dealer. Correspondence with Da Costa suggests that Constable selected items from a range sent to him and that they were selected scientifically, although it is possible that this represents flattery, rather than the actuality of the situation. It is clear that Constable was aiming to collect for the purposes of science, but was also interested in novelty.

In the construction of the cabinet, Constable's usual practice with acquired samples and collections was to relabel the items himself, but with a reference to the original collection. His cabinet, therefore, appears to be partly for his own interest, development and learning, rather than pursuing scientific advancement for the benefit of all. Equally, it may suggest an imitative role for the collection, replicating the museums and taxonomic collections of those who practiced more professionally in the field. In the next chapter, these habits will be compared to those employed in the formation of the plant collection, outlining comparable processes between the two.

The museum and experiment room discussed in chapter five gives some indication of one purpose of Constable's collection. The museum was larger than any other room on the ground floor, and the plan shows what are assumed to be display cabinets around the walls. The two impressive bay windows which would have provided excellent light to view the collections, and its proximity to, and view of, the stove and stove garden suggest that this was not simply a functional room, it was designed to be visited and enjoyed, and to project the image of Constable as a prolific collector, a man of science, and a contributor to knowledge.

Constable's half-brother Marmaduke also kept a natural history collection. He formed a 'museum' of natural history which unlike Constable's was kept at his more accessible townhouse in London, which, according to his memoirs, contained an extensive collection of living animals, particularly birds, which allowed him to study their habits (Fox, 1827, p. 10). In 1776 he moved his collection and his family to the estate at Wycliffe then in the North Riding of Yorkshire and now in County Durham. For his museum, he built "a handsome, large, airy room, in the back of the house, much better than that in London" (ibid.). Unlike Constable,

however, Tunstall was more active in the dissemination of his knowledge gained through the study of his collections. His contributions to the *Philosophical Transactions* have been noted above, as has his publication of *Ornithologia Britannica* (Tunstall, edition 1880) at the age of only twenty-eight.

No accounts of visitors to Burton Constable have been found linked to either pleasure or study, although there is some evidence that Constable welcomed visitors and assisted their understanding of his estate throughout their visit. The Great Hall contains a series of heraldic shields of the Constable lineage which were accompanied by a hand-held visitors' guide, to assist interpretation (Connell, 2014, p. 16). Presumably the same visitors would have been welcomed to the grounds and stoves, to marvel at the scale of the hot house and the range and quantity of plants growing and blossoming within. The large quantities of pineapples purchased, for example, confirm that the stove was not simply a botanical pursuit, and that Constable held the desire to impress along with other gentlemen of the period. The cabinet and plant collection formed part of a complex social tool, involving exotics, curiosity, beauty, scientific enquiry, and the social visibility of each.

Cabinet collections developed from their roots in wonder and exoticism to a more serious scholarly endeavour in the eighteenth century. The cabinet of natural and experimental philosophy aimed at an understanding of the world through Baconian systems of inductive reasoning and empirical observation. Experiment was a significant part of this new movement, as was a drive to make visible abstract scientific concepts, and to compare and classify the new and exotic with the native and mundane. Cabinets helped to shape the identity of a collector within societies and coffee houses, where individuals could trade and share their acquisitions. The country houses of the elite became laboratories and museums where collections were classified and studied.

The case studies above, in particular that of William Constable, have demonstrated that similar processes and ideologies surrounded the collection of static specimens in an indoor cabinet collection, and the cultivation of plants in a private 'botanical' flower garden or stove. In discussing the two assemblages together it can be seen that there is significant overlap, particularly the way that Constable catalogued and numbered the living plants in his stove and wider garden in his notebooks as discussed in chapter four. In this way, the living plant collections in the 'botanical' garden can be seen to be a true part of the cabinet of natural philosophy. If the theories and interpretations of collection are then applied to these plant collections, then a portion of the living components of a pleasure ground come to be seen as representations and constructors of identity and active agents of social transformation. They

enabled their owner to engage with wider social circles, to demonstrate their position as a person of enlightenment and to ally themselves with the new scientific method.

While many could collect static assemblages of natural history, it took a person of wealth and land, and a commitment of time and skill to cultivate a truly broad selection of plants which would contribute to the development of new knowledge. Through membership of societies, attendance at coffee houses, by forging relationships with professionals and increasing their own knowledge, the gentry class could use plants to mark themselves out as true contributors to science. The next chapter will discuss the dried collections of plants which bridged the gap between the indoor and outdoor collections; often originating from the stove or garden, and becoming part of the indoor cabinet.

CHAPTER 7: THE *HORTUS SICCUS* AND FLOWER PAINTINGS

> "Their barks, or roots, their flowers, or leaves,
> Thy Hortus Siccus still receives:
> In tomes twice ten, that work immense!
> By thee compil'd at vast expence;
> With utmost diligence amass'd,
> And shall as many ages last."
> (Evans, 1789) Extract from Abel Evans' Epistle to Dr. Jacob Bobart

The contents table of John Evelyn's (2001) *Elysium*, shows that the missing book three provided instructions for the composition of a *hortus hyemalis* (winter garden) for the purpose of making books of plants and flowers, in addition to detailing alternative methods of preservation. *Hortus hyemalis* seems to be a term used by Evelyn to refer to what we know now as an herbarium, and what most owners in the early modern period came to refer to as a *hortus siccus* or dry garden: a collection of volumes of pressed and mounted plant specimens. In Padua in 1645, Evelyn acquired a *hortus siccus* of plants from the physic garden, along with a series of 'tables' as an anatomical equivalent to the herbarium (Laird, 2015, p. 36). The understanding of both the make-up of the body, and the physiology of plants were parallel objectives. Evelyn showed his *hortus siccus* to Samuel Pepys in 1665, claiming that it was better than any herbal.

The tradition of keeping preserved parts of plants, most often as dried specimens mounted in a book, continued to grow throughout the remainder of the seventeenth and the eighteenth centuries. The Sloane Herbarium, now held in the Natural History Museum in London, contains 336[35] volumes of herbarium specimens, each containing a rich variety of preserved flora, alongside various and prolific further 'vegetable substances', including seeds, nuts and fruits. The collection comprises an estimated 120,000 specimens, provided by more than 300 named collectors (Jarvis, et al., 2012, p. 138). Here lies a wealth of information for the botanical and horticultural researcher, although it has seen very little published study in comparison to his collections of manuscripts and ethnographical curiosities. This represents, in microcosm, the contribution of herbaria to our current knowledge of eighteenth-century science, collection and entertainment, specifically, very little.

[35] Some are now bound together so the number is now 265.

Both the *hortus siccus* and botanically based flower paintings represent an attempt to preserve plant specimens for art and for study. In addition to the Sloane collection, Kent and Allen (1984) list 65 known private collectors of herbaria from the seventeenth century and 288 from the eighteenth century. These are of variable size and it is noted that many cannot now be traced, or are known to have been destroyed. Thanks to Kent and Allen, Sloane, and to documentary sources, we can be sure that the collection of herbarium specimens and the construction of a *hortus siccus* was a common pastime of natural historians, the landed gentry and the aristocracy. It is suggested here that the *hortus siccus* has been overlooked as a link between the aesthetic study of gardens and the scientific study of botany. This chapter will illustrate how the collections in the garden discussed in chapters three and four, and the scientific collections discussed in chapters five and six overlap within the boundaries of the herbarium, which allows the influence of one to extend to the other. This can be seen in the estates and cabinets of a number of collectors who will be discussed in this chapter.

William Constable was one such collector whose ten volume *hortus siccus* unusually survives, despite not being amalgamated into a wider collection. As far as research has been able to discern, it is the most complete eighteenth-century herbarium in Britain which is not in the Sloane collection. The volumes are a fascinating record of the plant conquests of one man in the north of England comprising a diverse array of flora from the local to the exotic, each carefully catalogued. The following chapter will place this collection in context, before undertaking an in-depth look at the *hortus siccus*, its structure, its component parts and what light this may shed on how plants and exotics were being consumed on this eighteenth-century estate. It will also consider the similar role of flower paintings and how an analysis of the two can further place the collection of plants into the scientific context of eighteenth-century scholarship and gardens.

THE *HORTUS SICCUS* PHENOMENON

In 1743, Thomas Eldridge published a book designed to facilitate the creation of a cabinet of curiosities. The full title of the work is,

> "A book of rarities: or, Cabinet of curiosities unlock'd, By the key of experience. Containing near an hundred useful and diverting amusements, with a new mthod of making artificial gardens; Italian shades; moving pictures; use of optick instruments; to make ornaments in immitation of China; to make a new invented machine, by which a common hour-glass shows the hour of the day; to make quills hard as steel; invisible writing; to make a Hortus Siccus; to keep kidney beans green all the year; to take the

> true picture of any herb a new treatise on making English wines, and many other rarities never before made publick" (Eldridge, 1743).

Eldridge's content confirms the place of the *hortus siccus* in the sphere of the wider curiosity collection, even that made for amusement. The bound collection of pressed plants was a seventeenth- and eighteenth-century phenomenon following its invention at the University of Padua in the sixteenth century (MacGregor, 2007, p. 129). In his diary, Samuel Pepys documented John Evelyn showing him his *hortus hyemalis*, "leaves laid up in a book of several plants. kept dry, which preserve Colour however, and look very finely, better than any herball" (Pepys in Latham (ed.), 1971). Zytaruk (2011, p. 21) has identified Evelyn's book three as the place in which he articulates the function of the collection a means of organising information, a common goal of the *hortus siccus*.

Preservation of seasonal specimens was a problem for early collectors and scholars of plants. Developments in taxidermy enabled them to more effectively preserve specimens of fauna (ibid., p. 5), and compared to this, pressing plants must have seemed relatively straight-forward. Most parts of a plant are difficult to preserve as discreet items, they are fleshy or moist and therefore degrade extremely quickly, so a preservation method was required. Most often this involved pressing the plants so they dried, and preserving them between pieces of paper, or binding them into books. The resulting *hortus siccus* was arranged in an order determined by the compiler. Plants were usually laid out in a systematic manner and often labelled: a manifestation of the scientific community's aims to document and classify as discussed in chapter five. Early herbariums contained mainly medicinal plants (Flannery, 2011, p. 291), but as plants developed new uses and identities, herbariums followed suit. Linnaeus, in his *Philosophia Botanica*, stated that an herbarium was better than any picture, and necessary for every botanist (Freer, 2005, p. 18).

In 1776 James Lee wrote to Linnaeus and described the feverish nature of the creation of Joseph Banks' herbarium,

> "Mr Banks Herbarium is certainly the greatest & I believe the best that ever was collected. It is the daily labour of many servants to paste them on paper, And Banks and Solander spend 4 or 5 hours every day in describing and arranging them" (Linnaean Society, 1776).

He also referenced one way in which they were used to advance the contemporary knowledge and classification of plants,

> "Mr Mason seems disappointed in not having the plant you think a species of Haemanthus, named after him. Indeed I wonder that Mr Banks & Solander, shou'd have

> been so far mistaken as not to have seen the string affinity it bears to that Genus, they have figured it from a dried specimen, & I will send you the figures of both species. I have many of them growing in my Garden some of them appears as if they should Flower this Winter when I shall have them delineated & described from living plants" (Linnaean Society, 1776).

This quote highlight's Lee's attempts to flatter Linnaeus' classification efforts and excuse Banks' and Solander's on the basis that their identification of this plant as a new genus was based on a dried specimen, seemingly demonstrating the advantage of description from living plants over dried. However, it is notable that Banks and Solander were identifying and classifying from dried specimens, in addition to the fact that the genus *Massonia*[36], after Francis Masson the Scottish botanist, was eventually officially described in 1780, suggesting that their initial identification was correct. The *hortus siccus* was a vital tool in the arsenal of the professional botanist at a time when new species were being described at a rate greater than ever before.

DiNoto and Winter (1999, p. 16) have identified the pressed plant specimen simply as a record of a species which could be available in every season. Before it was possible to capture images as photographs the ephemeral nature of flowering and growing plants proved a problem for systematists, and material had to be preserved and recorded if it were to be available for study or enjoyment. Furthermore, plants were coming from climates very different from that of Britain, so those which could not be successfully cultivated had to be recorded and preserved by other methods. This recording might be achieved by pressing, printing or painting, with pressing being the most accessible and affordable option open to most, providing the plant specimens were available. Bleichmar has translated a passage from Antonio Cavanilles (1745-1804), a Spanish taxonomic botanist who asserted that no botanist could see the full range of plants in the world, and so "he will resort to the hortus siccus or herbarium, which the princes of science acknowledged as useful and necessary" (Bleichmar, 2011, p. 391). The *hortus siccus* became a means of preserving, documenting and classifying vegetative material for professional and amateur botanists alike; it allowed plants to become part of a cabinet collection, and the achievements of one's own garden to be preserved. Due to the popularity of the practice, a number of publications offered instructions for preserving dried plants and creating a *hortus siccus*.

Around the year 1709, James Petiver provided "Directions for the Easie Making and Preserving Collections of all NATURAL Curiosities" (Petiver, 1709?) In the short pamphlet, he identified

[36] Which bears a striking resemblance to *Haemanthus*

ways of preserving animals and birds, fruit, seeds, plants, shells, insects, metals, minerals, ores and earths. His instructions for preserving plants are as follows,

> "All large pulpy moist fruit, that are apt to decay or rot, as Apples, Cherries, Cowcumbers, Oranges, and such like, must be set in Spirits or Pickle as Mangoes &c. and to each Fruit its desired you will pin or tye a sprig of its Leaves and Flowers
>
> All Seed and dry Fruit, as Nutts, Pods, Heads, Hulks, &c. these need no other Care but to be sent whole, and if you as a Leaf or two with its Flower, it will be the more instructive…
>
> In Collecting PLANTS, Pray observe to get that part of either Tree, or Herb, as hath its Flower, Seed or Fruit on it; but if neither then gather it as it is, and if the Leaves which grow near the Root of any Herb, differ from those above, be pleased to get both to Compleat the Specimen; these must be put into a Book, or Quire of Brown Paper stitch'd (which you must take with you) as soon as gathered; You must now and then shift these into fresh Books, to prevent either rotting themselves or Paper. N.B. All Gulph-Weeds, Sea-Mosses, Coralls, Corallines, Sea Feathers, Spunges, &c. may be put altogether into any old Box, or Barrel…
>
> N.B. As amongst Forreign Plants, the most common Grass, Rush, Moss, Fern, Thistle, Thorn, or vilest Weed you can find, will meet with Acceptance, as well as a scarcer Plant" (Petiver, 1709?)

Petiver's directions are enlightening on a number of issues. Firstly, the plant section is significant, suggesting that plants were among the most common or important components of a natural history collection, or proved the most troublesome in preservation. The section on pulpy fruits suggests that these were once part of the collections that survive partially today. Whilst the seeds, nuts and dried plant specimens sometimes survive, such as in Sloane's vegetable substances, the pulpy fruit section did not. The suggestion that one should carry pressing paper leads us to believe that many were collecting their own specimens or instructing others directly to do so on their behalf. Particularly interesting is the stress on more unusual samples, including the sponges and corals showing that collections were extremely ambitious and wide ranging, including aquatic and marine plants. The final section demonstrates that by this time natives and common plants were seen as being just as important to a gentleman's collection as exotic specimens.

The *hortus siccus* was a vital tool in recording plants encountered on voyages which may not survive the journey home, and which provided no seeds or roots which would travel well. Almost a century on from Petiver, in *Hortus Uptonensis* (Lettsom, 1783?), Lettsom ranked the

hortus siccus as the third preferred method of following the transportation of seeds and the transportation of the living plant. Along with his directions for transporting plants on ships, Lettsom noted that,

> "Sometimes it may prove inconvenient to convey the plants which may be discovered, when it would not be so to send them dried, in the form of a hortus-siccus. To do this in the best manner, and to make their stalks, leaves, &c. lie flat and smooth, the plants should be gathered in a dry day after the sun hath exhaled the dew, taking particular care to collect them in that state wherein the generic and specific characters are most conspicuous" (Lettsom, 1783?, pp. 9-10).

He went on to offer further details of how the specimens could be most usefully produced, copied, he noted, from "Dr. Withering's Botanical arrangement", a work which made botany and Linnaeus' classification system more accessible for the amateur botanist. Dr Withering's (1792, pp. xlv - lv) instructions for pressing plants were first given in the third volume of the second edition of his *A Botanical Arrangement of British Plants*, in which he offered eleven pages of directions for pressing plants, including numerous snippets of advice from others which has been communicated to Withering in correspondence. He particularly advocated the practice of ironing the specimens with a smoothing iron, which is "quite the best method to treat the different Species of Orchis and other slimy mucilaginous plants" (Withering, 1792, p. xlix).

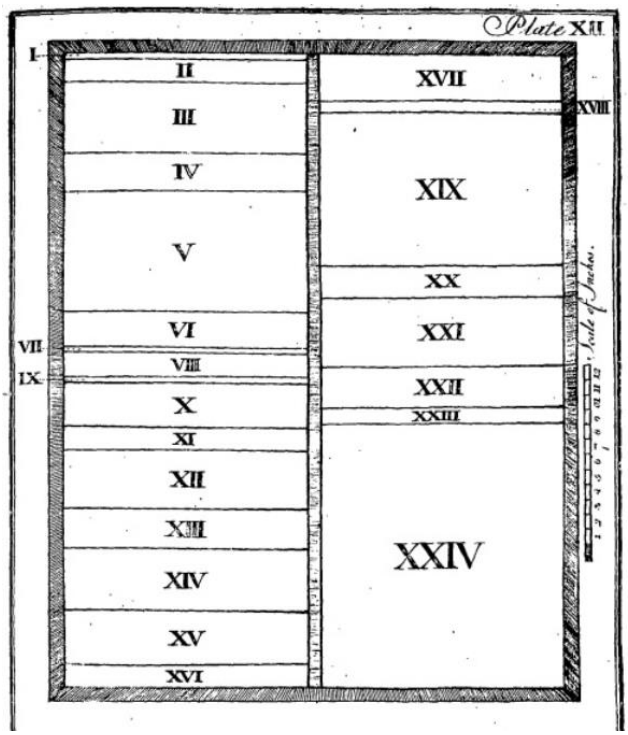


FIGURE 26: WITHERING'S PLATE DEMONSTRATING THE SECTION OF A *HORTUS SICCUS* DISPLAY CABINET (WITHERING, 1792, P. CXIII)

Withering went on to describe what he meant by the physical *hortus siccus*, which offers a rare description of the actual cabinet arrangement he found acceptable. Whether this format was highly used is uncertain, but it does seem likely that volumes of a herbarium would be kept safe within such a cabinet, as fossils were kept in bespoke drawered-cabinets. As this practice is not well recorded, it is worth relating in full here,

> "Where no better convenience can be had, the specimens may be disposed systematically in a large folio book; but a vegetable cabinet, called a Hortus Siccus, or

> an Herbarium, is, upon all accounts, more eligible. In plate XII [figure 1]. You have a section of an Herbarium, in the true proportions it ought to be made, for containing a compleat collection of British plants. By the assistance of this drawing, and the adjoining scale, a workman will readily make one. The drawers must have backs and sides, but no other front than a small ledge. Each drawer will be fourteen inches wide, and ten inches from the back to the front, after allowing half an inch for the thickness of the two sides, and a quarter of an inch for the thickness of the back. The sides of the drawers, in the part next the front, must be sloped off in a serpentine line, something like what the workmen call an ogee. The bottoms of the drawers must be made to slide in grooves cut in the uprights, so that no space may be lost between drawer and drawer.
>
> The cabinet shuts up with two doors in front, and the whole may stand upon a base, containing a few drawers for the reception of duplicates and papers. Where a very compleat collection of plants of the Cryptogamia class is intended, the space in the 24th drawer will be insufficient; but this may be remedied, by allotting the drawers in the base of the cabinet to that purpose" (Withering, 1792, pp. li-lii).

This account of a display cabinet for the specimens is what Withering refers to as the *hortus siccus*, rather than the collection of folios themselves. In Withering's (1796, pp. 37-38) third edition of the *Botanical Arrangement* he expanded his directions for preserving plants to include ferns, mosses, algae, lichens, sea weeds and fungi. Fungi would be difficult to preserve due to their fleshy nature, and so Withering described a method of pickling in jars using copper powder and spirit of wine. Specimens preserved in this way would be even more delicate than pressed plants and unlikely to survive to the present day, making it possible that there is a further gap in evidence from lost picked specimens in addition to the loss of pulpy fruit known from Petiver's directions.

Most of Withering's readers would be approaching the pressing of plants from a botanical perspective, but during the eighteenth century the *hortus siccus* was not solely the preserve of the amateur or professional scientific investigator. In 1776, Mr Bond of Bathford exhibited "The Hortus Siccus, in its Natural Colours" at the Academy of the Royal Incorporated Society of Artists of Great Britain on the Strand (Society of Artists of Great Britain, 1776, p. 19). Later, in 1784, *The Artist's Repository and Drawing Magazine* printed a number of methods of preserving plants taken from scientific publications, informing its artistically inclined readers that, "Hortus Siccus is a name given to a collection of dried plants. As the manner of preserving specimens of this kind may occasionally prove very serviceable to artists, we shall transcribe the process" (The Artist's Repository and Drawing Magazine, 1794, p. 52). Once again, plants and the cultural processes which surround them overlapped both the scientific and artistic spheres, the lack of distinction between the disciplines not making this unusual at the time.

Hortus siccus collections regularly featured in the sale of libraries after the death of a collector, including that of John, third Earl of Bute (Leigh and Sotheby, 1794), and "Francis William Skipwith, Esq; Late of Warwickshire, and of several other Gentlemen deceased" (Benjamin and John White, 1785) in 1785. The extent of collections described in the catalogue represent significant investment of time and money into the procuration, growth and study of plants, suggesting a wider motivation than the improvement of one's own botanical knowledge. The process of gathering collections and the knowledge which resulted from constructing and studying them enabled social links between gentlemen amateurs and botanists, physicians and philosophers. The resulting discourse had the potential to increase their social circle and status in society as discussed in chapter five. The *hortus siccus* was part of a wider collection tradition centred around identity and status, and yet an analysis of its place in eighteenth-century scholarship has been overlooked. It provides a meaningful link between gardens and collections, introducing new interpretations of meaning and purpose to eighteenth-century ornamental horticulture.

THE MODERN STUDY OF THE *HORTUS SICCUS*

Fossils, rocks, bones, and medals generally survive the years well, even when poorly conserved, stored or displayed. Even then, the survival of a collection is dependent on a number of factors. Jarvis, Spencer and Huxley (2012, p. 137) note the various fates which beset the Sloane collection, despite its residence in a museum, from burning by their keeper, to fragmentation, to dispersal into varying departments. The botanical specimens, however, have happily survived largely intact (Jarvis, et al., 2012, p. 138), in contrast to many other *hortus siccus*, including notable examples, which have been lost over the years. Analysis of the Sloane herbarium is typical of the study of plant specimens of this period. Despite the clear wealth of information, the collection has not been catalogued in detail since the time shortly after Sloane's death (ibid., p. 114). Herbaria, when they survive, are a valuable source of information often overlooked. A more detailed and systematic study would enable more thorough conclusions to be drawn about their place within the social, scientific and horticultural spheres.

Pressed specimens are incredibly fragile. The tissues which make up plants break down easily when devoid of moisture and soon crumble to dust. Modern day herbariums which contribute to botanical record and research are kept in specific, climate-controlled conditions to ensure that specimens survive, for example those kept by the Royal Horticultural Society at Wisley, and those kept by Royal Botanic Gardens, Kew. Even so, many of the older specimens unavoidably decay slowly. It is a fact that in a cabinet of curiosity, when the collection was no longer at its peak, the pressed plant specimens would be one of the first items to be lost. It is likely, therefore, that many collections have been lost or discarded, some within a relatively short period after their curation. Some historical herbaria are known only from other written

records. Rousseau reportedly constructed at least two herbaria for the Duchess of Portland during their friendship which he offered to her in a letter of 1773, but unfortunately these do not survive (Cook, 2007, p. 150). Rousseau himself also possessed an herbarium of over 2000 plants which he referred to as his 'sole library' (ibid., p. 151).

Kent and Allen (1984) have used these references to supplement surviving herbaria in order to create a list of all known herbaria in Britain and Ireland. Their *British and Irish Herbaria* lists 62 known herbaria from the seventeenth century and 288 from the eighteenth century. It was compiled, they note, by request to the curators of relevant institutions and "an intensive search of pertinent literature" (Kent & Allen, 1984, p. 1) and is the most comprehensive list of historical herbaria to date. Considering the vulnerability of such items, however, it can be reasonably concluded that the number extant in the seventeenth and eighteenth centuries would have been greater. The eighteenth-century *hortus siccus* of William Higdon (1742-1811), for example, is not included, having come to light whilst being auctioned in 1999. Therefore, our knowledge of their widespread existence in the eighteenth century should inform modern scholarship of plants and gardens despite the lack of surviving volumes.

When plant collections survive it can be difficult to map the sourcing of samples unless these are specifically labelled on the specimen. Delburgo (2012, p. 17) has noted that numerous unidentified individuals contributed to Sloane's collections, and that many of the plant specimens would have been collected by enslaved West Africans. Indeed, Parrish (2012, pp. 271-273) has demonstrated that slaves were used in the collection of material for many, including Petiver, Catesby, Collinson and Linnaeus. In many cases the samples would have been collected by others, pressed and purchased from dealers, pressed and mounted by someone in the employ of the collector, or even purchased as part of a collection following the death of the original owner. Of the 265 volumes in Sloane's collection, only nine contain material collected by Sloane himself (Jarvis, et al., 2012, p. 138).

The labelling of British specimens is often particularly poor in *hortus siccus*, and does not usually record the place and date of collection. This is even true of Sloane's British collections (Jarvis, et al., 2012, p. 141) and Constable's collections outlined below. Jarvis, Spencer and Huxley (ibid., p. 114) attribute this not to poor standards of recording but to the intended purpose of the collection. This was not to record the source of the samples but was to have an accurate identification of the sample. If this was present the information of origin was not required. Despite the difficulties, dried plant collections and other plant representations provide a fascinating and largely overlooked window into the motivations of the eighteenth-century collector. As a link between the outdoor living plant collections and the indoor cabinet of curiosity, the *hortus siccus* is key to our understanding of both within a fluid and curious society.

FLOWER AND BOTANICAL PAINTINGS

The herbarium tradition sprang from an impulse to collect, preserve and classify living and ephemeral objects, a struggle faced by botanists, explorers and private collectors alike. Paintings were also used by various different groups to create a lasting record of their plants. Plant portraits, usually botanical paintings but also direct plant prints, were also methods of recording plants which had been collected or cultivated, and their distinguishing characteristics. They may be seen to sit alongside portraits of animals and birds from menageries and aviaries, such as the picture of the third Duke of Richmond's moose which was painted by George Stubbs in 1770[37] (figure 27). These images are already recognised as key tools in the documentation and portrayal of natural history (see for example Bleichmar (2012), Kemp (1997, p. 348), Jarvis (2008) and Elliott (2008)). Here we are mostly concerned with the private collections of images associated with particular gardens and plant collections. Paintings of plants will be considered alongside the *hortus siccus*, as representative of similar motivation. The practice was not new as florilegia, collections of paintings usually of exotic plants, had been popular throughout the seventeenth century (Saunders, 1995, p. 41).

A discussion of the Flora of Cassiano dal Pozzo by Zytaruk (2011, pp. 7-15) has discussed paintings in the context of cabinet collections, identifying them as integral cabinet elements and a visual tool for collecting and organising knowledge. Similarly, Bleichmar (2011, pp. 377, 386) has identified them as bridging the gap between the collector and remote geographical locations, and between the field and the cabinet. Both discussions set botanical paintings firmly in the tradition of collecting and classifying. Artists were common members of exploratory voyages to ensure that the flora and fauna of newly discovered lands were successfully depicted and recorded (Saunders, 1995, p. 68). DiNoto and Winter (1999, p. 16), who discuss the production of herbariums, nature prints and plant portrait paintings from an artistic standpoint, identify paintings and prints as a method by which botanists who were unable to collect dried specimens could create their own plant collections.

[37] The moose later died and was slung up in the Duke's greenhouse so study of it could continue post-mortem. Gilbert White visited the Duke at the time and investigated the specimen, but his analysis was cut short by his inability to handle the smell (Laird, 2015, p. 237).

FIGURE 27: THE MOOSE BY STUBBS, 1770. THE MOOSE BELONGED TO CHARLES LENNOX, THIRD DUKE OF RICHMOND (HUNTERIAN MUSEUM AND ART GALLERY, 2017).

Paintings of plants could also be used as a record if the plant in question did not lend itself well to the format of the *hortus siccus*, including those too large or those of a succulent nature which would mould, rather than dry. Richard Bradley (1688-1732), a naturalist and botanist, published a *Treatise of Succulent Plants: containing, The Ficoides, Melocardui, Cerei and such others as are not capable of an Hortus-Siccus; all carefully Drawn after the Originals, and Engrav'd on Copper Plates; with their Characters, Descriptions, and manner of Culture* (Bradley, 1710?) to assist those who required an accurate botanical record of the plants but were unable to preserve the living material.

Constable was no exception to this tradition of recording; he commissioned the renowned botanical painter Georg Dionysus Ehret (1708 – 1770) to produce paintings for him on a number of occasions (see figure 28). Unfortunately, none of the paintings survive at Burton Constable, but evidence remains in the form of bills from Ehret. Two survive from 1762, one for a significant thirteen guineas and thirteen shillings (ERRO DDCC/153/52, February 1762) and one for "Five paintings of plants" for seven and a half guineas (ERRO DDCC/153/52, October 1762). A further order for four paintings of plants cost six guineas six shillings in December 1763 (ERRO DDCC/153/53/1, December 1763). These purchases represent significant investment equivalent to more than the yearly annual wage of the average worker. Constable was clearly keen to document his collection of plants and to preserve it in any way

FIGURE 28: GALEOPSIS TETRAHIT BY GEORGE EHRET, 1767, WATERCOLOUR ON VELLUM, HELD AT THE RHS LINDLEY LIBRARY (RHS LINDLEY LIBRARY), SHOWING THE INTRICACY OF EHRET'S WORK, AND ITS SIMILARITY TO HERBARIUM SAMPLES OF THE PERIOD.

he could, to display his cultivation triumphs and to record the results for prosperity. The images represented a similar impulse to the *hortus siccus*, to demonstrate success, and to preserve for scholarship.

Originating from a similar impulse, nature prints[38] offered an alternative form of plant recording: one which would not degrade and yet did not require the skill of a draughtsman or artist. This had been attempted by various individuals including Leonardo da Vinci, but was first employed on a commercial scale by Johann Hieronymous Kniphof (1704-63) in his *Botanica in Originali* in 1747 (Saunders, 1995, p. 144). The practice of nature printing did offer the possibility of direct prints of the actual object, but did not offer the opportunity to highlight any distinctive features not present on the original sample. Equally, from a commercial perspective, runs were limited or inefficient as only a limited number of prints could be taken from one sample before it degraded (Saunders, 1995, p. 144).

In 1772, Benjamin Martin published a work entitled *Typographia naturalis: or, the art of printing, or taking impressions from natural subjects, AS Leaves, Shells, Fossils, &c. AS Also From Medals, Intaglios, &c. by means of isinglass*[39]*; Proposed For The Rational Amusement Of The Ingenious Virtuosi* (Martin, 1772). He identified the advantages as compared to a *hortus siccus*,

> "I know no way so good as this for making a *Hortus Siccus*, which, in the usual Way, has always a mean Aspect, and a poor Effect. The Plants and their Leaves, Stalks, &c. inclosed between Papers, decay, dry, loose their Colour, and become brittle; and by such Incidents are useless in very few Years; whereas just the Contrary happens when the *Garden of Nature* is printed off in *Isinglass Copies*, and properly *coloured*, which then may always be viewed in its Bloom; the LEAVES, FLOWERS, *Parina*, &c. ever appear

[38] The practice has been discussed in Cave and Wakeman's *Typographia Naturalis* (Cave & Wakeman, 1967), and Cave's later *Impressions of Nature* (Cave, 2010) the practice offering similar outcomes to botanical painting.

[39] Isinglass is a substance derived from the dried swim bladders of fish which can be made into a paste or glue.

> vivid, strong, and natural, without being in the least liable to decay in any Length of Time; and are preserved in a very small Compass" (Martin, 1772, p. 4)

Among a further list of advantages, he also stated that "They are light, and maybe sent in Letters to any Part of the World, the others cannot" (Martin, 1772, p. 8). Clearly Martin was at pains to sell his idea, but the presence of this work and its contents highlights some of the concerns and frustrations which would have been felt by many collectors of the time. Today it is known that herbarium specimens can survive the years relatively well in favourable conditions, but the ephemerality of specimens would have led to uncertainty about their longevity in the eighteenth century. Certainly, as Martin suggests, representative colour would disappear from specimens relatively quickly. His reference to sending samples to other parts of the world clearly highlights that the trade in specimens and the sharing of discoveries was commonplace.

Painting and print clearly offered solutions to problems which would have been felt to a greater or lesser extent by collectors, dependent on the aims and objectives of their own personal collections. The printing method was not widely implemented in private collections, possibly due to the laborious process later outlined in Martin's work, however, painting and plant portraits were commonplace among the more affluent collectors. As discussed in chapter five, science and art had not yet diverged into discreet disciplines in the mid-eighteenth century, therefore the distinctions now placed on differentiation were not apparent to patrons such as Constable. Artistic prints may have been produced for their own beauty and for the continued recording of natural philosophical objects. The scientific intentions of these illustrations are often overlooked in scholarship, echoing the study of gardens of the period and its focus on the aesthetic, although the scientific intention of botanical works has now begun to be addressed (Nickelsen, 2006).

Consistent with the notion that spheres of study did not diverge until later, many artists, including George Ehret (1708-1770), were also botanists (Calmann, 1977, p. 9). Ehret was a significant figure in the botanical and horticultural field in Europe and married the sister of Philip Miller of the Chelsea Physic garden in London (Pulteney, 1790, p. 292). He illustrated many significant works including *Hortus Cliffortianus* for Linnaeus and *Hortus Indicus Malabaricus* for van Rheede, the Dutch Governor of Malabar (Calmann, 1977, pp. 16, 45-51). In Pulteney's *Historical and biographical sketches of the progress of botany in England*, Ehret is described as so;

> "He was well versed in the botany of this country, and delighted in painting the indigenous plants. He was ever best pleased when employed by scientific people, since his wish was always to follow nature, and to exhibit on his piece the true characters,

> without the smallest deviation for the sake of embellishment. Having early imbibed the principles of *Linnaeus's* system, he attended to the discrimination of the parts on which it was founded, with an accuracy that commanded observance; and while his excellence in delineating and painting drew admiration, and diffused a taste for the study of plants, the truth of his pencil instructed those who beheld it in the principles of the science" (Pulteney, 1790, p. 293).

It can clearly be seen from this description that the roles of botanist and artist overlapped in Ehret, as they did in other artists. The distinction of 'scientific people' by Pulteney is notable, as it suggests by omission that Ehret also illustrated for non-scientific people and liked their approach less, perhaps being requested to embellish the painting beyond realism to further their achievements in cultivation. Pulteney's clarity on the scientific nature of Ehret's favourite subjects places the flower painting firmly as a counterpart to the *hortus siccus*, as a permanent record of a plant found or cultivated.

Ehret also painted significant plants which flowered in botanical gardens (Saunders, 1995, p. 81). The context of these paintings, and the close correspondence of Linnaeus and Ehret informed the style of painting. Ehret's paintings often focus on the flower and its sexual characteristics (Saunders, 1995, pp. 88-92). In fact, Ehret was the first to illustrate Linnaeus' sexual system after the publication of *Hortus Cliffortianus* with his famous Tabella (fig. 29). The illustration was included in Linnaeus' *Genera Plantarum*, although Ehret's authorship is not credited (Calmann, 1977, pp. 9, 49). Despite this, Linnaeus and Ehret remained friends throughout their lives and Linnaeus offered Ehret the position of botanical draughtsman at Upsalla, which he declined (ibid., p. 50).

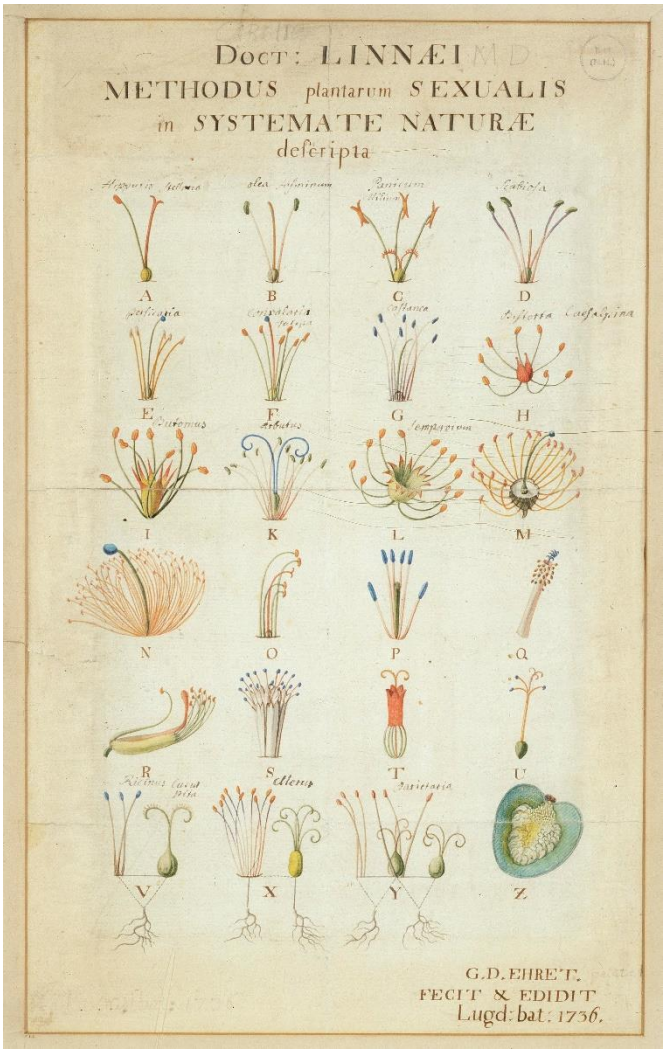


FIGURE 29: EHRET'S TABELLA ILLUSTRATION OF LINNAEUS' SEXUAL SYSTEM, FIRST PUBLISHED IN LINNAEUS' GENERA PLANTARUM IN 1737. (HART, 2011)

The botanical artist was in demand in the eighteenth century; a painting was not only a method of preserving a record of a plant in a beautiful way and with more certain longevity than a pressed sample, but a painting by a high-profile artist and botanist such as Ehret was a prized collection piece in itself. The flower painting had similar motivations to a *hortus siccus*, but brought added social kudos, and allied a collector with other, high profile botanists and collectors who were also using the artist to document their living collections.

THE EARLY MODERN AND ENLIGHTENMENT *HORTUS SICCUS*

Of Kent and Allen's 62 known herbaria from the seventeenth century, Mary Capel Somerset, the Duchess of Beaufort's Badminton-based collection represents one of the few surviving examples. In the late-seventeenth and early-eighteenth centuries, along with her living plant collections, the duchess collected dried plants and commissioned plant portraits to preserve her successful cultivations for posterity. She collected a twelve-volume herbarium of dried plants which was left to Hans Sloane on her death and two large volumes of plant paintings (Kell, 2004), representing plants in both her gardens at Badminton and Chelsea (Cottesloe, 1983, p. 9). The lack of attention afforded to Somerset's *hortus siccus* and paintings is illustrative of the general neglect of these items in scholarship. While clearly representing a significant investment of time, intellect and wealth, the pressed collections and paintings are granted only one page in the poetic biography of the duke and duchess by McClain (2001, p. 213), although the garden and living plant collection is discussed at length.

Munroe's (2011) discussion of Somerset as a lady who took her own contribution to scientific thought seriously has been discussed in chapter five, and is again pertinent to the *hortus siccus*. The private collection of letters accessed by Munroe include instructions written in a secretary's hand for having volumes of her herbarium bound,

> "Her Grace desires you will deliver the inclos^{d} Box with your owne hand to M^{r} Robert Child Goldsmith at Temple Barr: and that you'l goe to Doctor Sloane and give her Grace service to him and let him know she requests him to assist her Grace in having her Draught of Plant's bound and she desires you'l show him the inclos^{d} paper which is the exace measures of the Parchments" (Mary Somerset amanuensis July 1706 cited in (Munroe, 2011, p. 120).

A further passage in the same letter instructs that the binding be carried out by the same binder who services the Philosophical Transactions, which Munroe (2011, p. 121) has identified as an attempt by Somerset to emphasise her own scientific endeavour in the creation of her volumes.

A letter from the duchess to Sir Hans Sloane provides an insight into the compilation of the dried plant collection,

> "I am sorry I did not make the booke bigger, having neer as many more dry'd, some flowers I have added to embellish the book, I doubt you will find many false names, but they are as my Lords Gardiner [Adams] and I usually calls them, hee has been in this the scribe, and neither hee nor I understand latine so that I feare wee have commited many faults" Mary Somerset cited in (Chambers, 1997, p. 57).

While Somerset did not write the document herself, she was clearly involved in its production, and the plants required to be recorded were numerous. Many of the plants came from her own extensive stoves: Laird (2015, p. 90) noting that some of the plants show etiolation due to low light levels, the duchess owning a solid-roofed greenhouse, rather than a glass roofed stove. Some plants were collected elsewhere, with specimens of *Asplenium, Athyrium, Gentiana* and *Polystichum* being noted as gathered at Tunbridge (ibid., p. 91). Professionals supported by Somerset collected for her. From 1696-97 she financed Edward Lhwyd's collection expedition to Snowdonia, and several samples in the *hortus siccus* note the name of the naturalist and botanist (ibid., p. 95). The herbarium does not conform to a particular taxonomic system, being earlier in date than the Linnaean taxonomy which dominates later collections. Somerset's notations refer to earlier published authorities including Plukenet, Parkinson, Ray and Rheede's 1768 *Hortus Malabaricus* (Munroe, 2011, p. 121).

In addition to dried plant collections, Somerset also had her horticultural achievements documented in the form of a florilegium of paintings. Some plants, such as *Gomphocarpus fruticosus*, are represented both in the *hortus siccus* and the florilegium (Laird, 2015, pp. 90-91). The paintings of plants represent not only the physical likeness of the above-ground parts of the plant, but also the root systems, methods of propagation and the insects which may be found on them (Cottesloe, 1983, p. 9) – and notably the duchess was also an avid collector of insects (Kell, 2004). Interestingly, the notes on the duchess's flower paintings provide some information about the plants, for example that the Blattaria had a yellow flower and came from Virginia "and Buggs came out of it rather like six-legged spiders" (Cottesloe, 1983, p. 9). This

additional information sheds new light on the cultivation of the plants and brings into consideration the new pests and pathogens which must have been brought into the country with new introductions. The fact that the painting records bugs coming out of it, suggests that the plant was supplied to the duchess as a living specimen, rather than grown from seed.

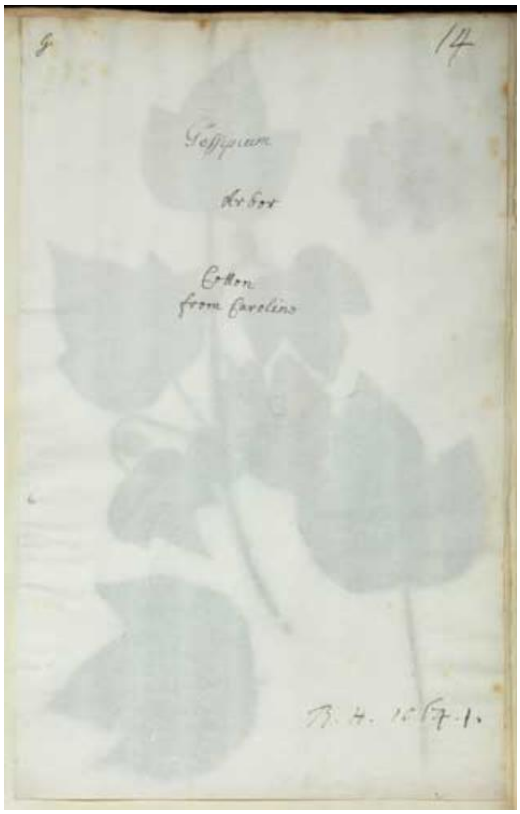


FIGURE 30: THE INFORMATION CONTAINED WITH A SAMPLE OF GOSSYPIUM (COTTON) IN THE DUCHESS OF BEAUFORT'S HERBARIUM SHOWING THE PLANT SAMPLE BEHIND. RECORDED AS BEING FROM BADMINTON HOUSE (NATURAL HISTORY MUSEUM, 2017)

One of the books of paintings was the work of 'Kychicus' as latinised in the volume itself (Cottesloe, 1983, p. 9), - the same artist painted many of Sloane's plants in his herbarium. Everhard Kychicus, also known as Kickius or Kick, lived at Badminton from 1703 to 1705, painting the flowers for the duchess. He also tutored one of the under-footmen of the house, Daniel Frankcom, who showed an aptitude for painting and went on to illustrate the second volume of paintings (ibid., p. 10). The paintings in the duchess's collection often depicted many plants on one sheet, occasionally exotics and weeds being pictured together (Laird, 2015, p. 76). They appear to be grouped randomly, perhaps according to what was looking its best at any one time, and also portray an air of drama, in addition to botanical identification (ibid., pp. 91, 93).

Unlike many collectors who came after her, the duchess's representations of flowers are primarily made up of those which were rare or special (Cottesloe, 1983, p. 19). The vast majority are exotics and noted as originating overseas (ibid.). The first seven paintings by Kickius were of *Aloes*, which she was particularly adept at growing (Laird, 2015, p. 89). As the duchess was so adept at growing and flowering plants, her herbarium contains a number of plants which are thought to be the oldest extant samples, including her sample of *Gossypium* (Fryxell, 1968, p. 382) shown in figure 30. Being earlier in date to many of the other case studies, it is notable in Somerset's collections that they were not systematically arranged. Similarly, Sloane's early collections were not well classified, being primarily an assemblage of the work of others he had obtained.

The Sloane Herbarium is a composite of the *hortus siccus* of many collectors from the sixteenth, seventeenth and eighteenth centuries. Sloane purchased these collections in his lifetime, and

used them to create an extensive reference library of native, exotic and cultivated plants. For the researcher of botany and collecting this is a valuable resource, as extremely few other discrete herbaria survive today, other than those preserved in the Sloane collection. He also created his own herbarium during his lifetime. Sloane had studied botany in Paris and collected a great number of rare plants and seeds while travelling through France as a young gentleman in the early 1680s (Birch, 2012, pp. 237-238). This no doubt directed and encouraged the collection of plant material as part of his wider cabinet discussed in chapter six. Apothecaries such as James Petiver and botanists such as Leonard Plukenet often held significant collections of plants in their cabinet as they were useful to their work. On their deaths, the collection of each came under the ownership of Sloane. At this time Sloane held what was probably the largest collection of dried plants in the world (Reveal, 1996, p. 79) and the herbarium is still a fascinating resource. It exists alongside a large collection of 'vegetable substances', further plant-derived collectables which could not as easily be pressed and preserved. A 1748 account of the collection given by Swedish botanist Pehr Kalm, recorded,

> "...a cupboard with little drawers full of all kinds of seed, some of which were in their fruits, others of which were removed from them. The seeds lay in rectangular boxes some with both the cover and the bottom of the box made of a crystal clear glass... In another room we then saw 336 volumes of dried and bound plants in royal folio, with as many plants mounted on each page as there was room for" (Kalm in Jarvis, et al., 2012, p. 137).

Whilst only nine volumes of the herbarium have specimens collected by Sloane himself, Plukenet's contribution numbers twenty-three volumes and Petiver's a staggering one-hundred-and-six. Petiver's was purchased for a rumoured £4000 (Jarvis, et al., 2012, p. 139), a vast sum in 1718, reflecting the value of pressed plant collections at the time. Conversely, other collectors are represented by only a few specimens: Joseph Andrews, a Suffolk apothecary, is represented by fewer than six plants spread throughout at least four of the volumes (Jarvis, et al., 2012, p. 143). The Sloane herbarium as a whole contains many samples from the North American colonies. Jarvis, Spencer and Huxley (2012, p. 146) note that he was a member of the Temple Coffee House botanical club in London, and was involve in contributing funds, along with others, to collecting trips to the colonies with instructions to return dried specimens, seeds and descriptions of interesting plants. There are also significant contributions from John Banister in Virginia, John Bartram in Philadelphia and Mark Catesby in Carolina (ibid., p. 148). It has the potential to add significantly to the study of gardens and collections if studied in more detail.[40]

[40] Despite the extent and the potential of the Sloane Herbarium, little of it has so far been studied in detail. A catalogue exists of the various authors of the herbarium prepared by J.

Many samples in the Sloane herbarium came from garden collections, for example those of the Duchess of Beaufort at Badminton and royal and private gardens in Amsterdam, Paris, Montpellier, Leiden, The Hague and Padua. The samples represent the earliest evidence of cultivation in England of at least seventy different species, and early cultivars and varieties are well-represented (ibid., p. 149), highlighting the contribution that the analysis of these herbarium collections could make to our understanding of the early history of modern horticulture in Britain.

In addition to Sloane's pressed plants, his collection also contained a significant amount of what are known as the vegetables and vegetable substances. Ninety drawers in the collection contain a variety of boxes and trays housing seeds, fruits, bark, roots and curios (ibid.). The samples are numbered and often labelled, giving a variety of depth of information on the sample. The numbers link to Sloane's three volume, hand-written catalogue (ibid.). Jarvis, Spencer and Huxley (ibid., p. 150) recognised that many of the earlier specimens relate to Sloane's pharmaceutical interests. Like the pressed specimens, the samples came from various sources, including Mark Catesby and the Duchess of Beaufort. She often sent seed of exotic species she had grown (ibid., p. 153), her wish to highlight her own collections being evident. The vegetable substances are often contained within small boxes, sealed with coloured paper and with sheets of glass on either side. This allowed the contents to be readily viewed by Sloane's visitors, without the risk of the contents being damaged (ibid., p. 153). These samples of vegetative substances are one of the only extant examples of the non-pressed, preserved plant tissue mentioned by Petiver and Withering which was discussed earlier in this chapter.

Within the modern study of herbaria, the focus is usually on botany and science, mainly due to modern divisions in scholarship; modern herbaria are curated by botany departments. A lack of study of the garden-sourced collections, however, misses a significant tranche of information which could be gleaned about the plants which were grown, the growing conditions and practices, and the purpose of these herbarium collections. For example Sloane's 'Vegetable Lamb of Tartary' has been discussed by Jarvis, Spencer and Huxley (2012, p. 150) in the context of plants, and by James Delbourgo (2012, p. 14) on the subject of curios, illustrating how the two spheres may enhance each other. A thorough study of the Sloane Herbarium, an

Dandy (1958) which provides a small amount of information about some of the contributors where possible. The collection has been the subject of an excellent chapter in in From Books to Bezoars (Jarvis, et al., 2012), which highlights the most significant elements of the collection, including its origins, makeup and some particularly notable samples. Happily, Victoria Pickering is currently writing up a PhD on Sloane's vegetable substances, which will include some information on and context for the herbarium volumes themselves. This represents the sum of the published work on the herbarium that can be found by the author.

impressive resource as it is, would shed further light on the collecting practices and principles of this most eminent scholar.

FIGURE 31: A SAMPLE OF MOLLUGO FROM SLOANE'S HERBARIUM INCLUDING THE RELATED DRAWING FROM KICKIUS. SLOANE HERBARIUM VOL. 4:9 (SLOANE, 2016)

Hans Sloane employed Everhard Kickius, the artist who painted the Duchess of Beaufort's images to produce the drawings for his *Voyage to Jamaica* on his return to England. Many of the drawings were taken straight from the pressed sample, and Jarvis, Spencer and Huxley (2012, p. 139) observe that indentations around some of the samples indicate that they had been traced (figure 31). Sloane had also employed an artist whilst in Jamaica to draw "Fruits that could not be dried or kept" (Jarvis, et al., 2012, p. 139; Sloane, 1707, preface). Sloane's collections therefore represent a desire to preserve and collect the world around him, despite his lack of time or inclination to systematically arrange or classify his specimens. For many later collectors, this became a primary purpose of their collection.

The Sloane collection is invaluable to modern botanical and horticultural scholarship, as without it few sixteenth-, seventeenth- and eighteenth-century herbaria would survive. Fewer volumes survive from the later half of the eighteenth century following Sloane's death in 1753, for example little is known of the vast herbarium collections of John Stuart, the third Earl of Bute, apart from their significant extent, and that they were sold off after his death. The catalogue of the auction of the botanical and natural history part of his library contained ten

lots of *hortus siccus*, or otherwise dried plants. Some of them are attributed to other collectors, for example "Dickson's Collection of Dryed Plants", and "A French Hortus Siccus, contained in many bundles and volumes" (Leigh and Sotheby, 1794, p. 64). Presumably Stuart's own volumes were the "Hortus Siccus, placed and classed from Ray, Gerrard and Parkinson, 3 vols, with an attempt to dry plants keeping their colour, and the methods used". The addition of a lot of "Four Volumes of loose dried plants not arranged" suggest that Stuart was collecting and pressing plants himself, or buying in pressed samples ready for mounting.

Other lots in the sale highlight the extent of the collection, including, "Hortus Siccus of Gronovius, and appendix of Linnaeus, contained in upwards of 250 volumes, or Cahiers, in regular order and carefully preserved" (ibid.). This was to be sold with an accompanying two volumes of Linnaeus's *Species Plantarum*, and an original letter from Dutch botanist Gronovius (1690-1762) to Lord Bute (ibid.). A further lot specified "Hortus Siccus of Linnaeus, 25 classes contained in about 240 volumes, neatly laid upon paper, *bordered and uniform*" (ibid.). Smaller items included a collection of mosses, and a volume of seaweeds. This list shows the incredible scale of the *hortus siccus* and highlights the time and effort which must have been involved in the creation of such large works. Clearly, Stuart was serious about the classification of plants and he is thought to have catalogued plants himself, including native plants around Highcliffe (Samuel, 2010, p. 16). Along with the *hortus siccus,* 980 of Stuart's natural history books and folios were sold, including works on the exotic plants at Kew, *Historia Plantarum* and *Catalogus Plantarum*, a catalogue of the Tradescant museum and a copy of Commelini's *Flora Malabarica* in which it is recorded that Stuart had noted that "I have added here all the Syn. of Linnaeus taken from the last editions of the Spec. Plant. and his Systemae Naturae" (Leigh and Sotheby, 1794, pp. 10-12, 20).

Stuart also owned a significant number of botanical paintings. The sale catalogue made particular reference to,

> "His Lordship's NOBLE COLLECTION OF COLOURED DRAWINGS IN NATURAL HISTORY, By Taylor, Ehret, Sibilla Merian, Miller, Van Huyssum, Ditche Lee, Pallio, Plumier, Jacquin, Schoouman, and many others. Likewise, COLOURED DRAWINGS OF BENGAL PLANTS; 3 vols. Folio" (Leigh and Sotheby, 1794).

The catalogue listed 216 drawings of natural history subjects, the vast majority of them plants, in addition to ten pages of plant paintings and drawings, many sold in lots of 50. Clearly the earl had invested heavily in paintings of his own plants, and of paintings of plants from other parts of the world. The samples from both Gronovius and Linnaeus were botanically based and would certainly have been arranged systematically, aiding Stuart in creating his own collection of plants and his botanical tables.

Although not as prolific, the physician John Fothergill was just as scientific, as well as particularly fond of works of art. The lack of evidence for Fothergill's collections as a whole means that there is no evidence of a *hortus siccus*, although Gilbert Thompson's memoir of Fothergill records his procurement and enjoyment of scientifically based plant paintings,

> "As Natural History, and especially the study of Botany, was his prevailing amusement; he constantly employed, not only those artists who excelled, but others who aspired to excel, in producing exact and highly finished drawings of plants and flowers; at once facilitating the knowledge of that science, and adding to its delightfulness. He had also formed a design to obtain accurate draughts of all the rare plants of our own nation, but did not live to see it perfected" (Thompson, 1782, p. 36).

The same memoir contains an account from Joseph Banks and Daniel Solander of Fothergill's achievements in natural history. The account notes that,

> "That science might not suffer a loss when a plant he had cultivated should die, he liberally paid the best artist the country afforded to draw the new ones as they came to perfection; and so numerous were they at last, that he found it necessary to employ more artists than one, in order to keep pace with their increase... He left behind him above 1200 drawings, chiefly on vellum, by Ehret, Taylor, Harris, Miller and Miss Ann Lee, which have been lately purchased for the Empress of Russia" (Banks and Solander in Thompson, 1782, p. 39).

Fothergill's garden in Upton, Essex has been discussed as a botanical garden in chapter four, its usefulness and function as a scientific resource clearly demonstrable. The drawings were obviously keenly sought by Fothergill, and their completion at the height of the plants' growth and display was so important that he would employ more than one artist at a time to capture their image and qualities at the most appropriate moment. Clearly, in Fothergill's case, the drawings represent a method of capturing the plants for his scientific collection.

Margaret Cavendish Bentinck, the Duchess of Portland was similarly motivated and prolific in commissioning paintings and her extensive garden and cabinet collections have already been discussed. Additionally, an impressive array of pressed plants and flower paintings linked these two spheres of her life. She was an avid collector of Ehret's paintings, who she commissioned to produce three hundred drawings of exotics and five hundred of English plants in 1768. These were sold with the rest of the museum following the duchess's death and were amongst the highest priced lots to be sold (Stott, 2013, p. 37). A *hortus siccus* also made up part of her cabinet collection, illustrating her particular drive to document the plants she invested so heavily in growing. The emphasis on English plants is significant, and highlights the move towards

systematic documentation, rather than a focus on the new and wonderful, which had been represented in the collections of Mary Somerset in the previous century.

The destination of the bulk of the duchess's flower paintings and herbarium specimens is unfortunately unknown. All were sold following her death, with only a small number now held at her birthplace, the Welbeck Estate, having been purchased back by one of her sons at a later date. The extant specimens comprise two lists of the plants which were sketched, one of which is by Ehret and the other unauthored; 31 watercolour sketches of plants; and 60 mounted herbarium specimens, most labelled in pencil[41] (Welbeck 20419, n.d.; Welbeck 20419, Jan 11 1779; Welbeck 20419, 1770; Welbeck 20420, n.d.). The catalogue of lists, sketches and plants can be found in appendix 2.

Ten of the plants depicted in the watercolour sketches are mentioned in the unauthored plant list of 1770 (Welbeck 20419, 1770). Unusual labelling, for example the *Allium* being labelled with the epithet "fr. Wm." on both the sketch and in the list suggests that the items are linked. The partial overlap between sources suggests that some sketches are missing, being named on the list and not extant in the folio of paintings, and that there was originally another list of paintings: many sketches survive which are not listed on the surviving papers. The vast majority of the 162 different plants identified from the lists, sketches and herbarium are native to Britain and Europe. The sources are uncertain, but it is likely that many were wild-collected for the purposes of drawing and pressing due to their native provenance. Some, such as *Umbilicus rupestris*, named on the list of Ehret's drawings as *Cotyledon umbilicus venericus*, are more limited in their distribution in England and botanising trips further afield may have been required. It is known that the duchess and her friend Mrs Delany often embarked on plant collecting excursions for natives, in addition to the collecting trips of the duchess's resident tutor, Reverend John Lightfoot (Stott, 2013, p. 42).

There are few showy specimens among the plants sketched and pressed, suggesting that the collection was one of scholarship and classification, rather than propaganda and status. Plants such as *Oenanthe crocata* (hemlock); toad flax; enchanter's nightshade; shepherd's purse; *Veronica chamaedris* (speedwell); and *Aegopodium podagraria* (ground elder); would have been a common sight in the English countryside. Like Constable, the duchess collected the mundane in addition to the spectacular. While the above account documents extant specimens, the remainder of the extensive collection of paintings and pressed plants remain elusive. Certainly, some formed part of her cabinet, including "a complete collection of British Grasses, in two portfolios" and "a miscellany of dried plants, British and Exotic, many of them curious and rare"

[41] These were viewed and catalogued by the author on a visit made in February 2017

(Skinner and Co., 1786, p. 66) which were sold after her death. The pressed plant specimens make up an extremely small part of the sale, however, being limited to these two items.

It is known that Rousseau had made two portable herbaria for the duchess, offered to her in a letter, but the result of this exchange is unknown (Cook, 2007, p. 150). Rousseau wrote to her in 1769 stating that, "I departed with some amateurs for Mount Pila, situated twelve or thirteen leagues from here in the hope, Madam Duchess, of finding some plants or some seeds which merited a place in your herbarium or in your gardens" (Rousseau, cited in Cook, 2007, p. 152). Rousseau also noted in a letter of 1768 that he had begun a catalogue of a herbarium which had been a present to him. He sent the catalogue to the duchess and requested that she note the plants she did not have so he could send them to her fresh or dried for her garden or herbarium (Cook, 2007, p. 151).

The significant number of the Duchess of Portland's paintings suggests an attempt to systematically record the plants in her collection and others that she encountered through networks and botanising trips. In a letter dated June 22nd but with no given year, John Lightfoot recorded that Mr Teesdale of Castle Howard inYork[42] had sent,

> "…a little Box containing three flowering Plants of the Satyrium albidum, & one of the Cornus herbacea. Mr Lightfoot would beg Leave to recommend in the Drawing of the Satyrium that one of the Flowers be figur'd separate from the Plant, of its natural Size, & another a little magnified, otherwise they are so small & crowded, that it will be impossible to give a proper or distinct Representation of the Plant. After the Drawing is completed, Mr. L: would beg Leave (if it be not too much Trouble) that her Grace would send a Specimen of it in Flower to Uxbridge, as Mr Lightfoot has never seen it in that State" (UNMSC Pwe 22, June 22nd n.y.)

The letter suggests that the plants were provided for the purpose of being drawn in order to create a botanical reference document. It is also an enlightening example of the relationship between a professional botanist and a patron. The botanist, Lightfoot, was directing the collection and recording of a new specimen, whilst the patron enabled the action to take place via the resources she was able to provide. It should be noted that while the professional is polite to the patron, he is able to ask for the specimen to be sent down to him post-recording for his own interest. The patron becomes akin to a service for the botanist, providing the tools necessary for successful classification.

The Duchess of Portland was friends with Queen Charlotte – the royal family often visited Bulstrode and occasionally arrived unannounced (Hayden, 1980, pp. 136-140). John Lightfoot

[42] Also used by Constable for sourcing plants.

was also the Duchess of Portland's chaplain and after his death his herbarium was bought for Queen Charlotte by George III (Campbell Orr, 2004, p. 172). It is probable that the Queen had been inspired in the collection of plants by the duchess's collections and the paper collages of flowers produced by Mrs Delany, the duchess's friend. The Queen had expressed interest in mounting plant specimens on black paper, a visual style used by Delany (Desmond, 1998, p. 79) who became famous for her flower portraits made of paper and tissue, even during her lifetime. Twice widowed, Delany was fourteen years older than the duchess, but the great friends shared artistic and intellectual interests and Delany stayed at Bulstrode for six months every year for seventeen years (Hayden, 1980, p. 106).

Delany's paper images were made by painstakingly cutting out small pieces of paper, and adhering them to a board in a manner which created a remarkably accurate image of a plant (Hulton, 1980, p. 13). Each small piece of paper was delicately cut to represent parts of the flower including the petals, stamens, calyx, leaves and even veins, and different coloured paper shows the effect of dramatic lighting (Hayden, 1980, p. 132). The images (figure 32) were cut to be lifesize, and if the appropriate shade could not be found in paper, Mrs Delany would dye it herself (ibid., p. 133). In addition to the accurate physical depiction of the flowers, Mrs Delany recorded the Linnaean classification of the flower on most of her images (ibid., p. 146), as would be expected in a standard *hortus siccus*. Mrs Delany referred to the pieces as 'paper mosaicks', and to her collection as a whole as her Herbal, or *hortus siccus* (ibid., p. 132). By 1784 she had completed nearly a thousand images in this way (Stott, 2013, p. 43) and it was only her failing eyesight at the age of 82 that made her cease her work (Hulton, 1980, p. 13). Her works

FIGURE 32: A *PHYSALIS* DEPICTED IN PAPER BY MRS DELANY (PEACOCK PAPER GARDEN, 2016)

became so well-regarded that the King and Queen sent plants from Kew for Delany to represent in paper, in addition to live plants for the duchess's garden (Stott, 2013, p. 45). Plants were also sent by Philip Miller from Chelsea Physic Garden, of which eighteen are represented in the *hortus siccus,* and a visit to Lord and Lady Bute at Luton Park also resulted in the depiction of some of their extensive plant collections (Hayden, 1980, pp. 136,139). Further sources of reference material betray other collectors of plants who may not otherwise be recognised as such. These include Lord Dartmouth, Secretary for Trade and Plantations, Lord Rockingham, former Prime Minister, Lord Willoughby and Lord Mansfield (ibid., p. 143).

Although the flowers were impressively botanically accurate, the work was not meant primarily as a botanical resource. An edited autobiography of Delany, first produced by her great-niece Lady Llanover in 1861, records that the following was handwritten in 1779 and placed in the first volume of her work,

> "The paper Mosaic work was begun in the 74th year of my age (which I at first only meant as an imitation of an hortus siccus) and as an *employment* and *amusement*, to supply the loss of *those* that had formerly been delightful to me; but had lost their power of pleasing; being depriv'd of that friend, whose partial approbation was my pride and had stampt a value on them.
>
> Tho' the effect of this work was more than I expected, I thought that a *whim* of my own fancy might fondly beguile my judgment to think better of it than it deserved; and I shou'd have dropp'd the attempt as vain, had not the Duchess Dowager of Portland look'd on it with favourable eyes. Her approbation was such a sanction to my undertaking, as made it appear of consequence and gave me courage to go on with confidence. To *her* I owe the spirit of pursuing it with diligence and pleasure. To *her* I owe more than I dare express, but my heart will ever feel with the utmost gratitude, and tenderest affection, the honour and delight I have enjoy'd in her most generous, steady, and delicate friendship, for above forty years" (Delany in Chauncey Woolsey, S. (ed.), 1879, pp. 348-349).

The flowers had given Mrs Delany new pleasure following the death of her second husband, and were meant as an imitation of a botanical record, rather than an accurate depiction. Nevertheless, it is interesting that this botanical art, meant as an amusement, should follow the same structure as, and imitate, the *hortus siccus*. The fact that the *hortus siccus* was an item known well enough to imitate, is telling of its popularity. Also notable is the evident strident encouragement of Delany's endeavours by the Duchess of Portland. Naturally, one impulse must be the concern for a friend's well-being following a bereavement, but the duchess's passion for collecting, ordering and botanising must have been piqued by the creation of such

accurate depictions. They perhaps provided a further artistic foil for her plants, less botanical than Ehret's depictions, and themselves dramatically beautiful.

WILLIAM CONSTABLE'S PLANT COLLECTIONS

Although the examples discussed above provide ample evidence of the existence of the *hortus siccus* in natural philosophy collections of the eighteenth century, the poor survival rates of the volumes themselves means that a more detailed analysis is often impossible. It is particularly frustrating given the potential of the *hortus siccus* in demonstrating a link between the cabinet of curiosity and living plant collections. Uniquely, the collections at Burton Constable survive to such an extent that it is possible to identify interaction and establish connections between the stove and garden plants, the cabinet collection and the *hortus siccus*. An herbarium of ten volumes survives at the hall, alongside a substantial archive of seed and plant bills, correspondence and accounts from throughout Constable's life. Together, and viewed alongside the landscape and cabinet evidence, these provide an excellent insight into the active role of plants in the life of an eighteenth-century gentleman.

THE BURTON CONSTABLE *HORTUS SICCUS*

The ten-volume *hortus siccus* of pressed plants (Burton Constable *Hortus Siccus*, 1742 to 176?) makes up a significant part of Constable's complete collection. Collected and curated over approximately twenty to twenty-five years from the early-1740s to mid-1760s, the *hortus siccus* represents a significant portion of his collecting endeavours and is one of the most complete eighteenth-century herbaria which remains within its original private collection. Around one and a half thousand plants survive in the ten volumes, nine of the volumes are bound in leather, one is a complete volume but misses its leather covering, and further pages of plants were found in the process of being pressed between books in the library. The preservation of the plant specimens is variable, but many are in excellent condition, clearly displaying distinctive traits and even colour. A catalogue of the contents created by the author can be found in appendix 3.

The collection is incomplete – suggested by the earliest volume being labelled as number IV. Although there is no documentary evidence for the earlier volumes (indeed there is very little supporting evidence for the collection as a whole), the classification system in volume IV begins in the middle of Linnaeus' first sexual system, suggesting that volumes I, II and III must have existed but have been lost. The surviving volumes include three embossed as numbers IV, V and VI, six embossed as numbers 1 to 6 and the unbound volume. A summary of the volumes is provided in table 1 and typical samples from each series are show in in figure 33. Three distinct

series of the herbarium are identifiable; volumes IV to VI, volumes 1 to 5, and volume 6 with the unbound volume, although IV to VI do not follow a sequential classification system. The bookplate in volume 1 reads,

"Hortus Siccus **Ubi** **Planta Distributa Sunt** **Secundum** **Linnai Systema Sexuale** **apud Burton Constable** **In Cava Deira** **Anno** **Ab Incarnatione** **Christi** **1763"** (Burton Constable *Hortus Siccus*, 1763)	Which translates as,	"Dry garden, where plants are distributed according to the sexual system of Linnaeus at Burton Constable in Cava Deira[43] in the year of Christ 1763".

The collection was collated over a considerable period of time and by various contributors, evidenced through variations in recording, mounting, papers and methods of classification which will be discussed below. The earliest volume, volume IV, records more collection dates than any other and is in a different hand to the later volumes. The earliest dated specimens in volume IV are from 1742 and the latest from 1751. The only date in the later volumes is from the bookplate referenced above dating it to 1763, apart from one sample in volume 5 which is dated 1746, perhaps removed from an earlier collection to help to complete the classification system in the later 1763 series. The specimens are mounted on loose sheets which were then inserted into the bound volumes. The watermarks on the paper also suggest various different origins of the samples, although plants in the process of being pressed were found between book pages in the library closet at Burton Constable in the twentieth century (Hall, 1992, p. 101), indicating that some samples were collected and pressed by Constable or a member of his household.

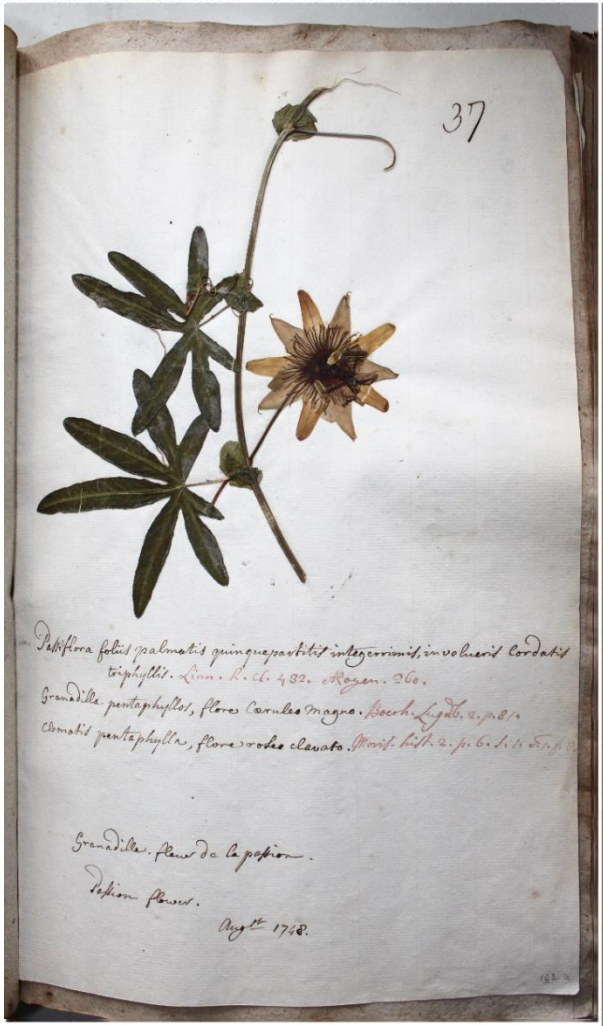
Constable's herbarium varies significantly in the quantity, style and quality of the labelling. Some sections have no labelling at all, while the earliest surviving volume is extensively notated, referencing the classification systems of various seventeenth and eighteenth-century botanists. The labelling style and handwriting throughout the herbarium is inconsistent, suggesting a number of contributors. Comparison of the handwriting with Constable's correspondence confirms that some labels are clearly in Constable's hand, but no other

[43] Cava Deira was the eighteenth-century term for the area in East Yorkshire now known as Holderness

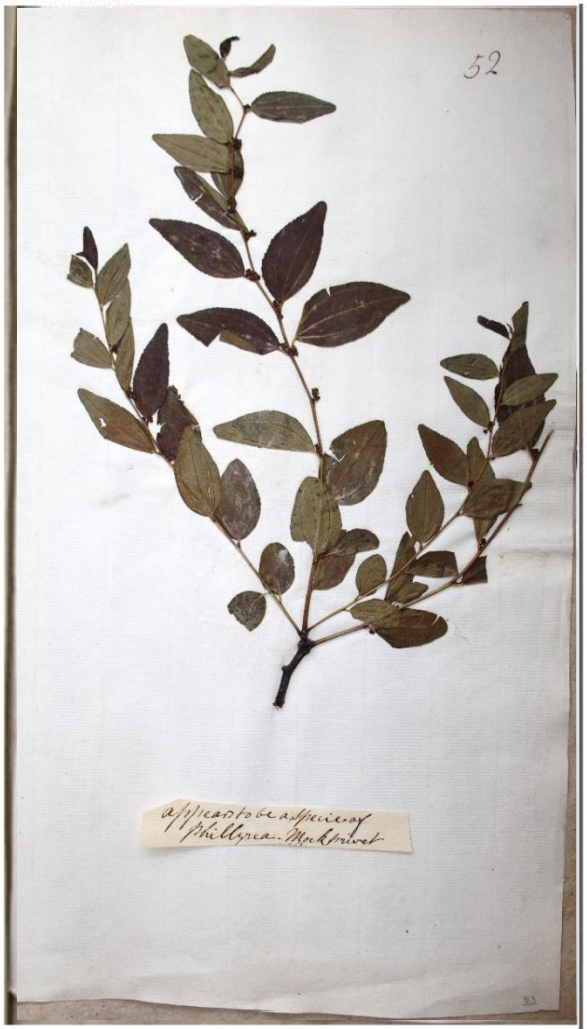
comparisons have been possible. Often where provenances are given for plants they appear to correlate with locations to which Constable may have been, for example, many come from Paris in the early 1740s when Constable was on his travels following his education at Douai. Many labels, however, are in different handwriting, some samples even have two different styles, which is perhaps not surprising given the seeming eclectic nature of the collection of the samples. The volumes and their individual characteristics are discussed further below, along with an analysis of the provenance of some of the samples and comparisons with Constable's living and cabinet collections.

TABLE 1: SUMMARY OF THE BURTON CONSTABLE HERBARIUM

Volume	Date	No. of samples	Order	Linnaean Class range	Authors	Characteristics
I II III	Presumed earlier volumes: missing					
IV	1742-1756?	198	*Hortus cliffortianus* (Linnaeus). Other systems referenced. Page number in top right corner.	N/A	Unknown author in red and black ink (Author 1). Thomas Kyle. William Constable.	Herbaceous angiosperms, shrubs, grasses, ferns, seaweeds, mosses and lichens. Extensive labelling and provenance. Includes dioecious plants.
V	1742-	126	Unclassified grouping, some thematic. Page number in top right corner.	N/A	Unknown author in red and black ink (Author 1). Thomas Kyle.	Does not follow IV in classification. Some similar labelling to Volume IV. Predominantly herbaceous plants. Less extensively labelled than IV.
VI	No dates, pre-1763	137	Unclassified grouping, some thematic. Page number in top right corner.	N/A	Unknown author in elaborate hand often using vernacular names. Thomas Kyle.	Predominantly trees and shrubs. Brief labelling.
1	1763 onwards	136	*Species Plantarum* (Linnaeus). Begins at the start of the classification system: 1:1. Contains classification 'header notes'.	1:1 to 5:1	William Constable. Thomas Kyle.	All similar in style. Follows Linnaean sexual system with a note at the beginning of each new 'class'. Also reference's Hudson's *Flora Anglica*. Occasional loose pages in the wrong volumes.
2		107		5:1 to 10:3		
3		130		10:3 to 14:1		
4		105		14:2 to 19:1		
5		116		19:1 to 24:1		
6	No date	154	*Species Plantarum* (Linnaeus) Other systems referenced.	1:1 to 5:1	Author 1 as above. Thomas Kyle.	Predominantly herbaceous plants, grasses, shrubs and trees. Follows Linnaean sexual system. Also reference's Hudson's *Flora Anglica*.
Unbound vol.	No date	162	*Species Plantarum* (Linnaeus) Other systems referenced.	5:1 to 12:4	Author 1 as above. Thomas Kyle.	
Loose pages	No date	49	*Species Plantarum* (Linnaeus) Other systems referenced.	12:5 to 17:3	Author 1 as above. Thomas Kyle.	Mainly herbaceous plants. Follows Linnaean sexual system. Also reference's Hudson's *Flora Anglica*.

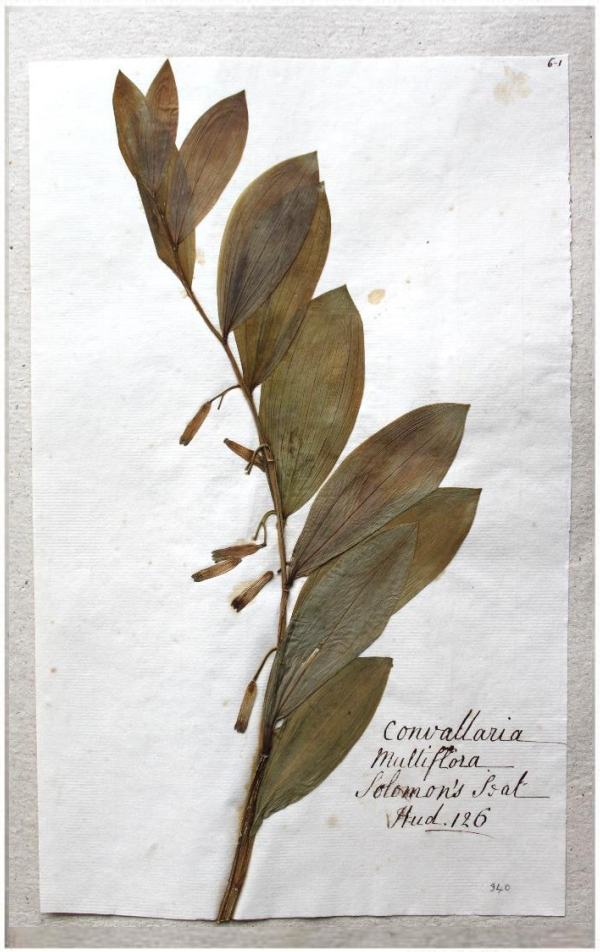


Typical sample: Volume IV
Text in black and red ink, various authors of classification systems referenced. Identification in black, author in red. Page numbers top right.



Typical sample: Volume V
Identification mostly on slips of paper. Page numbers top right.

Typical sample: Volume VI
Mostly large specimens of shrubs and trees. Identification directly on the page in Constable's hand, further identification on slips of paper.



Typical samples: Volumes 1 to 5

Samples labelled top right with Linnaean class and order. Identification also by Hudson's system. Some samples labelled directly on sheet in Constable's hand. Most samples have additional identification on slip of paper, thought to be by Thomas Kyle.

Typical sample: Volume 6

Samples labelled top right with Linnaean class and order (starts again at 1:1 following sequential series through volumes 1-5). Identification also by Hudson's system. Identification mostly on slips of paper.

FIGURE 33: EXAMPLES OF TYPICAL SAMPLES IN EACH BURTON CONSTABLE HERBARIUM SERIES (AUTHOR)

THE VOLUMES

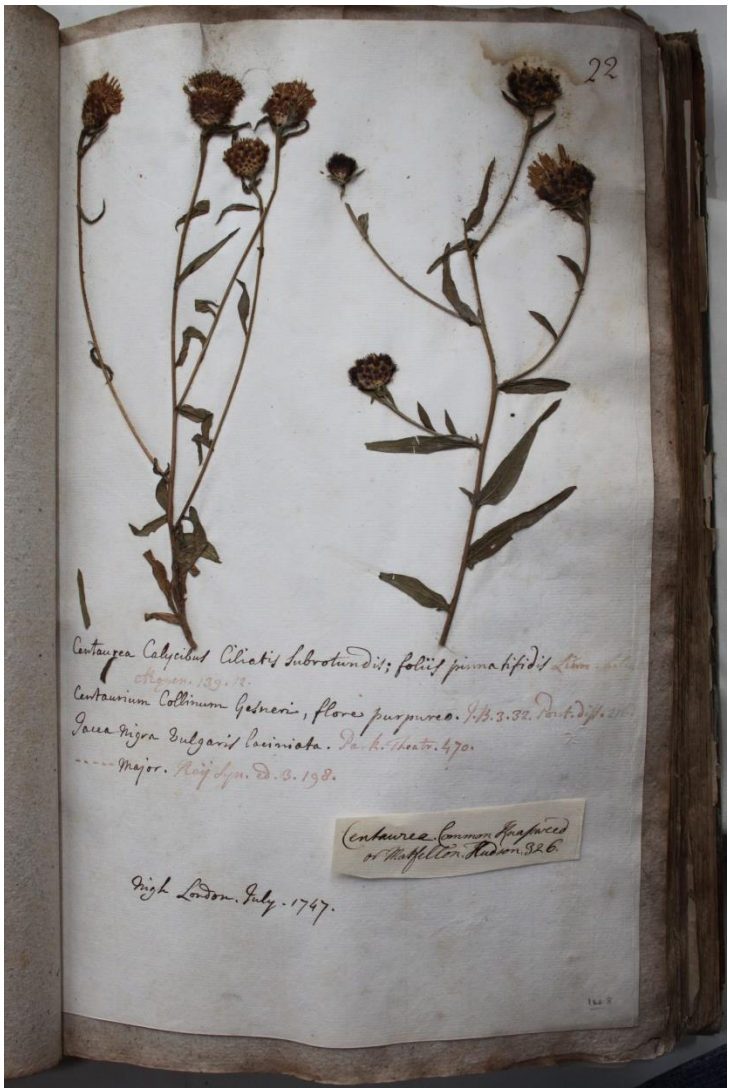


FIGURE 34: AN HERBARIUM PAGE FROM VOLUME IV HOWING A CENTAURIA COLLECTED FROM 'HIGH LONDON' IN 1747. THE RED WRITING NOTES THE DIFFERENT AUTHORS USED FOR IDENTIFICATION (AUTHOR).

Volume IV appears to be the earliest volume and is by far the most thoroughly labelled. The labelling suggests that it was compiled between 1742 and 1751. One specimen of the grass *Phalaris* notes a collection date of 1749, but contains an additional comment which reads, "this year 1751, I pass't over a field of several acres at Childwick near St Albans" (Burton Constable *Hortus Siccus*, 1742-1751, p. sample 68), which suggests the volume may have been completed in that year. The specimens are from a wide variety of plant groups including herbaceous angiosperms, shrubs, grasses, ferns, seaweeds, mosses and lichens. Various classification systems are used within the volume; the differing identifications are written in black ink with the name of the author afterwards in red ink. The primary system used within this volume is that from *Hortus Cliffortianus*, Linneaus' catalogue of the herbarium and botanical garden at Hartekamp in Holland, owned by George Clifford. Most specimens are referenced to the classification methods of more than one author, including the often-referenced botanists Tournefort, Bauhin and Ray, but also John Parkinson's *Theatrum Botanicum* (1640), botanists Boerhaave, Gerard, Dillenius, Plukenet, Cesalpino, Hermann (*Flore Lugduno-Batavae Flores*), Commelin and van Royen among others. An example is shown in figure 34.

The extensive labelling in the volume gives more information than any of the other volumes for dates and provenance. Eighty-four out of the 198 samples in the volume have a provenance, most of them from London and France. Sources include "Lord Petre's, Thorton Hall", "Outside Paris" and "Hampstead Heath" – some were from collectors and some from gardens. A number

of specimens are labelled as coming from Lord Petre of Thorndon Hall in Essex, and Dr Butner (1716-1801), the German naturalist and philologist. Three are identified as being obtained from Emanuel Mendes da Costa, the same dealer who would supply Constable's fossils later in the 1760s. The high proportion of labels of provenance suggests that many of the samples weren't collected by Constable, and instead obtained or picked by the scribe on his behalf. The volume dates to the time before and just after William inherited Burton Constable Hall and built his gardens and stoves, meaning that he did not yet have the facilities to grow his own specimens. The practice of recording origin reduced as the volumes progressed, perhaps because many of the later specimens came from his own garden.

The pages of volume IV are labelled in the top right-hand corner simply with a page number: in later volumes this changed to the order and class of the Linnaean binomial system. The labelling is in at least three different hands, the two main styles belonging to someone other than Constable. The bulk of the annotation is in a neat and distinct hand using the red and black ink noted above, but on many of the samples there is an added a small scrap of loose paper with further identification on it often followed by '*Hud.*', a reference to William Hudson's *Flora Anglica*. Evidently these volumes were revisited at a later stage for revision following the publication of Hudson's book in 1762.

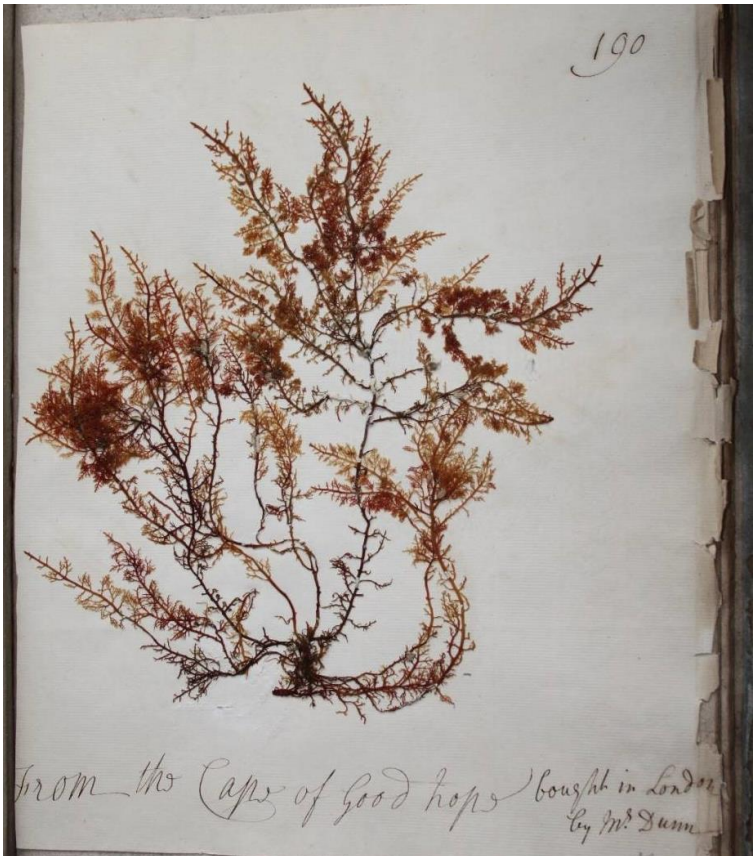


FIGURE 35: AN EXAMPLE OF A SEAWEED FROM VOLUME IV, LABELLED BY CONSTABLE AS BEING FROM THE CAPE OF GOOD HOPE AND BOUGHT IN LONDON BY MR DUNN (AUTHOR)

The handwriting on the loose notes is consistent with that on the bills written by Constable's gardener Thomas Kyle, suggesting that Kyle was given the task of revisiting the herbarium to make further identification and revision during his employment. Kyle was evidently an excellent plantsman, who must have been invaluable to Constable's studies. The final hand in the volume is that of Constable, easily identifiable by his regular tendency to scribe his 'e's backwards. These notes are on samples of unidentified seaweeds, that Constable

attributed to having come from the Cape of Good Hope and bought in London by his agent, John Dunn (figure 35).

Some trouble has been taken to select representative samples of plants to be pressed. Most of the plants are represented well, with flowers present on those which bear them. In the Dioecia class, male and female samples have been collected for *Salix, Cannabis* and *Mercurialis*. The collector must have had knowledge of collections, positions of wild plants or nurserymen who reliably produced a wide range of plants. It is most likely that the samples were purposefully sought out for the collection as specific examples, rather than collected at random.

The subsequent volumes V and VI do not follow volume IV in its classification system. They both contain an unclassified assortment of plants, with volume V containing mainly herbaceous plants and volume VI containing mainly samples of trees with some shrubs. There are hints at a more thematic grouping system, with three samples grouped together which come from America, although no wider system can now be identified. Volume V contains two samples of the same plant next to each other, *Spiraea americana*, or American Meadow Sweet, the duplication suggesting that plants were being obtained from different sources.

FIGURE 3649: NOTE IN VOLUME V ATTRIBUTED TO THOMAS KYLE: "TAMUS BLACK [DELETED: BROI] BRIONY. I AM NOT SURE IF THIS NAME IS RIGHT" (AUTHOR).

While they do not follow volume IV in classification, volume V contains many samples labelled in the same neat black and red hand, although volume VI does not. Volume VI contains what seems to be a neat but elaborate fourth hand, which noted names, usually common names, on the mounting paper itself.

Some of the notes show a good knowledge of botany, for examples volume V contains a note on the mounting page of a *Ranunculus* in the black and red hand which states that the type sample noted by John Ray, "is no more than the leafe of this plant, beset with insects eggs. A specimen whereof Mr J. Hill shew'd me in his Hortus Siccus, Gathered by himselfe" (Burton Constable *Hortus Siccus*, 1742 to 1757, p. 88). Another note in the same hand states that a sample of *Tradescantia virginiana* came "from my own garden London. July 1745" (ibid., p. 78). The unnamed author of these notes was obviously involved in the botanical world and had contacts with other herbarium creators, in addition to his own garden in the capital which housed plants from America. It is probable that the scribe was collecting and mounting the specimens before making the annotation. Both volumes, like volume IV, contain the loose

notes in the same hand as that attributed to Kyle. Many of these notes aid in or change the identification, often including the phrase 'this appears to be' and occasionally, 'I am not sure if this is right' (figure 36).

The notation on the mounting paper in volume VI appears to be in a different hand to that in volumes IV and V, although it is slightly variable within the volume and may be a result of the same author writing more carefully. However, the author was seemingly less thorough than

FIGURE 37: AN EXAMPLE OF A TREE SAMPLE FROM VOLUME VI, SHOWING THE ORIGINAL IDENTIFICATION AND THE CORRECTION, THOUGHT TO BE BY THE GARDENER THOMAS KYLE (AUTHOR)

that of earlier volumes, usually using vernacular or common names, and the loose notes attributed to Kyle often state that the original identification was incorrect in addition to giving the correct name. While the author who wrote in black and red did not name the samples, this volume does contain an excerpt of Linnaeus' *Genera Plantarum* (1737) in the same hand, although it is a loose booklet and was possibly added to the volume at a later date. This volume is notable for containing predominantly trees and shrubs, including fruit trees, an example is shown in figure 37. Unlike other volumes, it also contains the season in some samples, stating the month of collection. For most of the genus contained in this volume there are multiple species or varieties, including five different types of walnut (*Juglans*), five oaks (*Quercus*), six elms (*Ulmus*) and four planes (*Platanus*).

Following the creation of volumes IV, V and VI, Constable apparently resolved to start his collection again. He created a new series of volumes, this time numbered in the Arabic system. The legend at the front of volume 1 stated that it used the second Linnaean sexual system, and gave a date of 1763. This identifies the system laid out by Linnaeus in *Species Plantarum*, published in 1753 and this is indeed apparent in the following five volumes of Constable's *hortus siccus*. This is likely the reason for the decision to restart the collection – volumes IV to V were created before the publication of the binomial system, and William was keen that his collection was up to date. His new series of pressed plants start again from the beginning of Linnaeus' classifications at 1:1, and many plants present in the earlier series (IV to VI) are repeated with fresh specimens.

Volumes 1 to 5 are similar in style. They follow the Linnaean binomial system with a note at the beginning of each new class and order specifying the name and how many stamina and styles the flowers within each possessed. Within a topic which was controversial at the time due to its sexual nature, Constable refers to the stamina as 'husbands' and the styles as 'wives' (figure 38). In the first of these volumes, the notes on the mounting paper are primarily in Constable's hand, suggesting that at this time, he was more personally involved in the construction of the herbarium. This would coincide with William settling at Burton Constable and building his first hot house in the late 1750s and early 1760s.

In addition to Constable's labels, the loose notes attributed to Thomas Kyle are once again present throughout the volumes. One note in volume 2 specifies that the sample of 'Rapunculus' is from Mr Knowlton, Constable's project manager for his garden buildings, but that the author isn't sure if it is right. These notes become increasingly frequent throughout the volumes. Indeed, volume 4 is primarily labelled by Kyle, rather than Constable. The purpose of the notes is not certain. It is possible that they were produced by Kyle as identification labels to accompany specimens of live plants from the garden or stove into the house for pressing, although this interpretation does not account for the initial incorrect identification of many of the specimens. A more likely possibility is that Kyle reviewed the pressed and collected samples in retrospect,

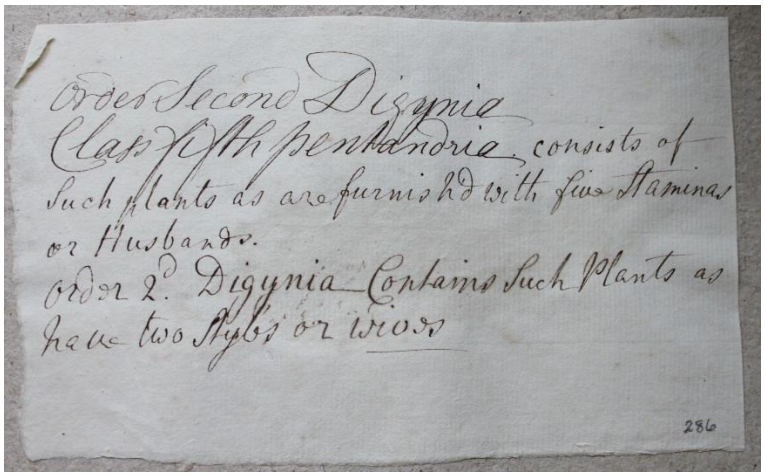


FIGURE 3864: AN ORDER AND CLASS NOTE FROM VOLUME 2, NOTING THE SEXUAL PARTS OF THE FLOWER AS 'HUSBANDS' AND 'WIVES' (AUTHOR).

making amends to identifications where needed (an example is provided in figure 39). This would suggest that these particular samples came from places other than Constable's garden, whether collected on travels or purchased from collectors.

FIGURE 3972: A SAMPLE FROM VOLUME 2 SHOWING *PARIS QUADRIFOLIA* AND A CONFIRMATION FROM THOMAS KYLE (AUTHOR)

Following numerically, but again differing in classification and character, volume 6 begins once more at Linnaeus' class 1:1, the start of the class system specified in *Species Plantarum*. The additional unbound volume follows on, presumably intended as volume 7, and the loose sheets found in the library closet would have been part of the third volume. This series represents the third iteration of the sequence identified by Linnaeus, and again they contain new specimens of plants already represented in earlier volumes, including *Jasminum, Aesculus, Epilobium* and *Paris quadrifolia*. Volumes 6 and 7 contain a wide variety of plants, including herbaceous, grasses, shrubs and trees. A handwritten excerpt of part of Linnaeus's *Genera Plantarum* was found in volume 6. Loose notes are present once more, but, like series IV to VI, make reference to authors other than Linnaeus. The handwriting is again indicative of belonging to Kyle, although in many examples it is slightly neater than in earlier volumes. A sample of *Convolvulus* in volume 6 references Philip Miller's (1759) *Gardener's Dictionary*. Neither volume 6 or the unbound volume contain the class headers seen in volumes 1 to 5.

A bundle of forty-nine specimens mounted on paper were found within the pages of an unbound book (Hall, 1992, p. 101), presumably in the process of being pressed, and follow the classification sequence from the unbound volume. These have since been returned to controlled preservation conditions with the other specimens. The presence of specimens in the process of being pressed within the house seems to confirm that live samples were regularly arriving from the garden and stoves at Burton Constable, and therefore that Thomas Kyle must have taken an active role in their production.

Volume 6, the unbound volume and the loose sheets, therefore represent a third phase of collection in the process of composition. The numerical system suggests that these volumes date later than volumes 1 to 5. The replication of the same plants within the two series through different samples is curious. Linnaeus' directions on creating an herbarium, which were followed by Constable, suggest mounting the samples on loose sheets within volumes so that they can later be reordered if necessary. While this was possible within Constable's collection, he evidently collected or took delivery of duplicate samples, however, there is no record of the motivation behind this change. It may indicate that the samples were bought in bulk as part of an existing collection, although the presence of samples in the process of pressing appears to suggest otherwise. It is more probable that as the sample identification was written directly on the mounting paper of the earlier series, that he wished for clean samples which could bear the identification solely in the new binomial system.

All ten volumes of the *hortus siccus* contain a wide variety of plants, ranging from exotics which could only be grown under protection in the UK, to native wildflowers, all alongside each other within the evolving classification systems. Some of the volumes have their own character, particularly volume VI which consists of mainly trees and shrubs, but equally, some follow as a series. It is clear that Constable was embracing contemporary scientific thought and structuring his own collections accordingly. Although the *hortus siccus* volumes are only dated approximately, the dates present suggest that Constable adopted the Linnaean systems broadly in line with other scholars of the time. It was during the period between the publication of *Genera Plantarum* in 1737 and *Species Plantarum* in 1753 that the sexual system was progressively being accepted around Europe. A late convert, Philip Miller partially adopted the system in the seventh edition of his celebrated and popular *Gardener's Dictionary* in 1759 (Miller, 1759), before adopting it completely in the eighth edition of 1768 (Miller, 1768).

The peak of Constable's interest in the plant collections relating to his cabinet seems to be from the 1740s to late 1760s, after which date the herbarium ceases to be augmented. This may be partly due to the death of his London agent, John Dunn in 1778, Constable's own marriage in 1775, his ailing health, or simply a wish to focus his attentions on other areas of interest. The dates corelate to the period of the stove garden being located on the west front of the house, and the huge museum room being built in the hall. Clearly this was the zenith of Constable's collecting activity, a pastime he pursued with fervour both indoors and out.

CORRELATIONS: LIVE COLLECTIONS AND HERBARIUM

From the preceding discussions of Constable's pressed and live collections of plants, it is clear that the two were linked. The two separate collections show similarities of motivation and approach, and further detailed comparison of the provenance of samples and the construction of the assemblages can provide a greater insight into the inextricable relationship between these two collections. This suggests that the outdoors and indoors may not be so easily divided for study as is often suggested in the study of the country house. The provenance of the plants in the pressed collection can provide a valuable insight into this relationship, although it is only occasionally stated overtly on the herbarium sheets. The most frequent statement of the provenance of a sample occurs in the first surviving volume, volume IV, with some in volume V and very few in the later volumes. This is due to the change in author and the fact that many samples in the later volumes originated from Constable's own garden.

A sample of aster and a sample of woundwort, both in volume 5 note that they are 'in the greenhouse', indicating that Constable was using his stoves to supply at least some of the plants for the herbarium by the 1760s. This is borne out by the number of duplications between surviving plant and seed bills and the herbarium, and correlates with the increasing activity and facilities in the garden at the time. From the surviving bills, at least 45 species appear as samples in the collection of 1,420 pressed plants. The first bill which clearly demonstrates these links is one from London nurseryman, Chris Gray, dated 1759 (ERRO DDCC/153/51/14). The bill identifies that 86 discreet species were purchased by Constable, and 28 of these feature in the later series of the herbarium collections. These include a neopolitan medlar, at least two different phillyreas, a bladder senna, the nettle tree and a deciduous cypress which features in two volumes. A further 20 plants which feature in the *hortus siccus* were bought from Robert Black and William Perfect between 1759 and 1762 as either seeds or plants, a full list of correlations is provided in appendix 4. The sensitive plant seed purchased from Perfects in December 1762 and discussed in chapter four is presumably the source of the sample of *Mimosa pudica* in volume 3 of the *hortus siccus* (figure 40), demonstrating a clear link between purchase, propagation, cultivation and preservation.

Despite this significant link, a caveat should be made, as a number of species are replicated between Volume VI of the herbarium and a bill from Perfect's for a large order of trees dated 1779, a number of years after this volume is thought to have been produced. These trees are, however, more common varieties than many of the others referenced in the earlier bills, and may have been bought for planting and improving the grounds as discussed in chapter four.

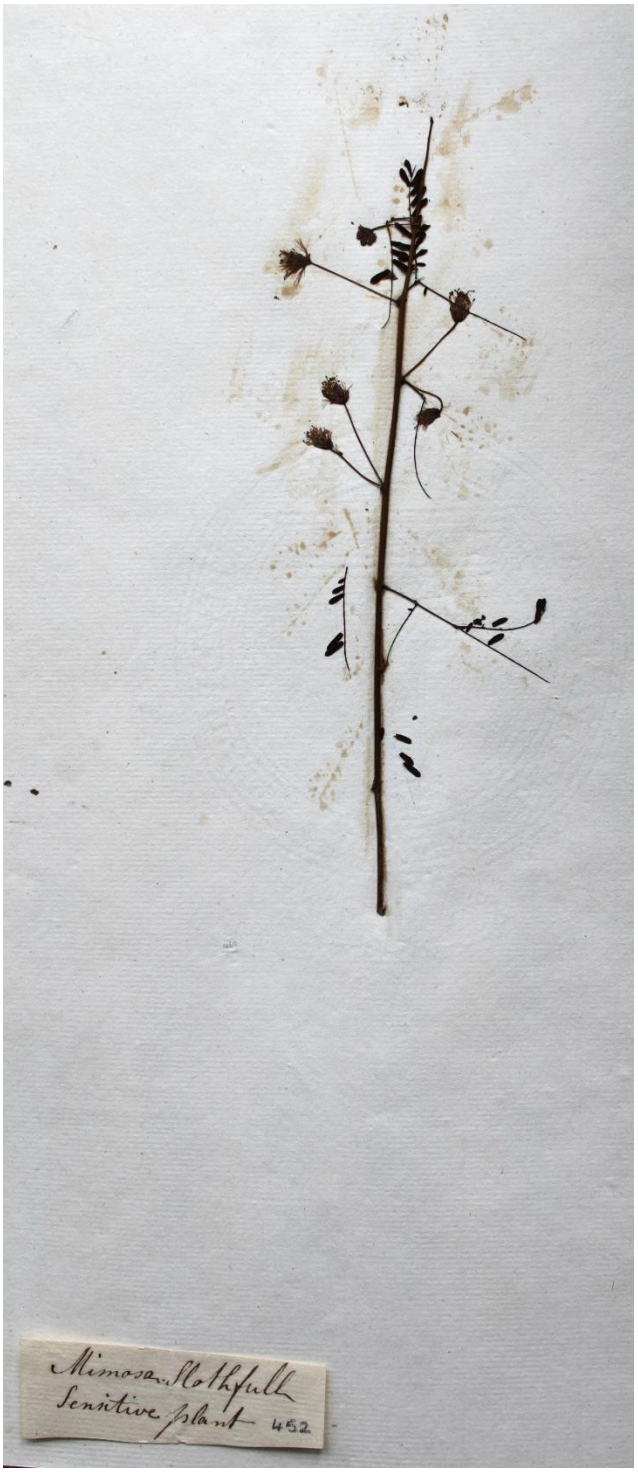


FIGURE 40: *MIMOSA PUDICA*, CAPTIONED AS 'MIMOSA, SLOTHFULL SENSITIVE PLANT" IN VOLUME 3 OF THE BURTON CONSTABLE *HORTUS SICCUS*. SEED OF THE SENSITIVE PLANT WAS PURCHASED FROM PERFECTS NURSERY IN 1762 (AUTHOR).

While exotic and curious plants were being sourced from plant and seedsmen, it was not only these which featured in the *hortus siccus*. Significantly, many of the wild plants which were noted as growing in Constable's stove garden are also documented in the herbarium. Hall (1986, p. 13) notes that 113 of the numbered plants in the commonplace notebook correspond to the same number and the same species in Constable's *hortus siccus*. Here again is a direct connection between the cultivated plants outside and the dried plant collections which were part of the cabinet. Plants were being grown, labelled, harvested and pressed in an attempt to create a universal botanical record. This tendency to maintain an interest in the local and ordinary is identified by Impey and MacGregor (Impey & MacGregor, 1985). They note that with the arrival of the exotic and curious, came a necessity to compare with the hitherto unconsidered elements of their own surroundings. The ideological correlation between the cabinet and Constable's horticultural efforts highlight the unexplored, but undeniably close relationship between the garden, the herbarium and the cabinet of curiosity.

PLANTS AND WIDER COLLECTIONS

The evidence above clearly shows that Constable's herbarium was compiled through a variety of methods using samples from various sources. Although many of the later samples in particular came from his own garden and stove, he also used other external sources to help compile his h*ortus siccus,* certainly for the earlier collections, but even for the later ones when he was more settled at Burton Constable. A letter from Emanuel Mendes da Costa dated July 1760 stated that,

> "I have just left Mr Sherwood and his family who present their compliments to you. Mr Sherwood has received your Letter and is extremely busy pasting the plants on paper according to your desire, and hopes to send them to you per next Monday's carrier" (ERRO DDCC/145/1, 1 July 1760).

Constable owned his own garden and stove by this stage, but it is clear that plants were also being collected and mounted for him in London. These samples may have been intended for volumes V or VI, but equally may have found their way into the later, post-1763 series if they were later identified by the Linnaean system. Mr Sherwood was identified by Da Costa in the same letter as being his "very Esteemed friend" (ERRO DDCC/145/1, 1 July 1760), and is also involved in providing fossils to Constable.

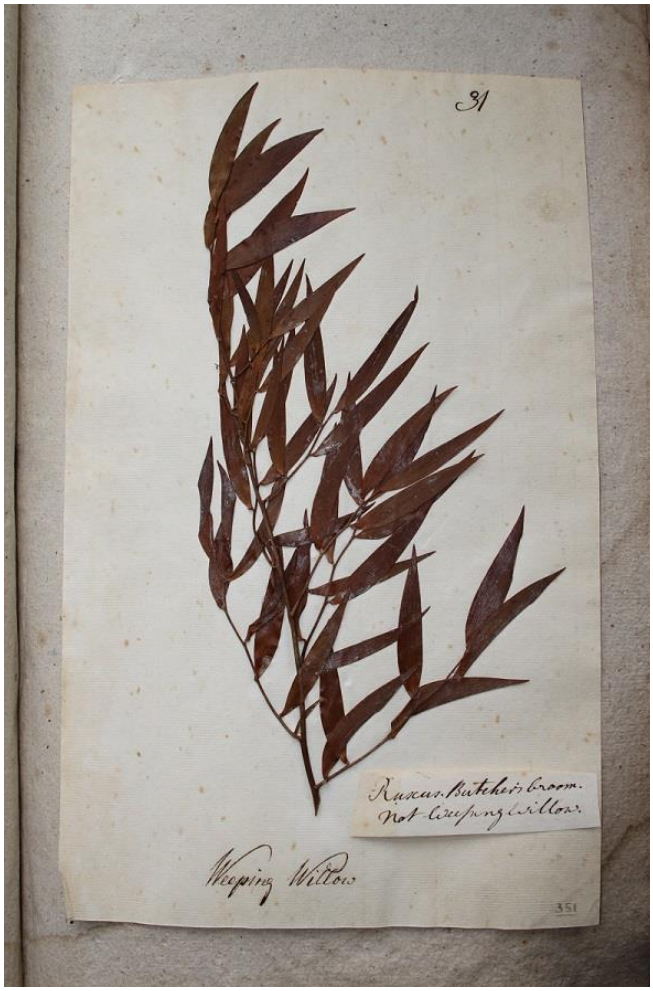


FIGURE 41: A SAMPLE OF *DANAE RACEMOSA* LABELLED ORIGINALLY AS WEEPING WILLOW, AND SECONDARILY AS RUSCUS (AUTHOR)

Where Da Costa and Sherwood sourced the pressed plants they provided for the collection is uncertain, but it is clear that pressed plants were passing through the hands of dealers in the same manner as other curiosities. Many samples may have come from growers or nurserymen who were cultivating new and interesting plants. A link between these nurseries and the trade of dried specimens has yet to be explored, and would provide

valuable insight into the procuration of plants as objects of curiosity. Pressed plants often arrived in the country as specimens sent from abroad, as this was logistically more efficient than transporting live plants. If the intention was to sell the specimens dry when they arrived in Britain, it made economic sense for traders and explorers to press them during the voyage to avoid the unnecessary expense of keeping plants alive on a long journey.

The reclassification of a number of plants in the herbarium may shed further light on this process. A sample of what appears to be *Danae racemosa*[44] in volume VI (figure 41) is identified on the mounting paper itself as 'Weeping Willow'. In what appears to be a later addition, a scrap of paper has been added in a different hand remarking "Ruscus. Butcher's broom. Not Weeping Willow". As discussed above, these revisions are common throughout the herbarium and likely completed by Thomas Kyle, Constable's passionate gardener. This is an enlightening example. In the mid-eighteenth century the accepted name for this specimen would have been *Ruscus*, later revised to *Danae*, therefore Kyle's revised identification is correct. *Danae* exhibits tough, leaf-like structures which are cladodes rather than leaves; modified stem structures which photosynthesise without losing excess moisture as would a leaf. The genus is therefore distinctive, in addition to the fact that the stems are bright green, rather than the brown or yellow of willow. It is unlikely that a specimen of *Danae* would be mistaken for a weeping willow as a live specimen.

There are number of possibilities for this error in identification. It seems most likely that the specimens were coming to whoever labelled them as dried, unlabelled specimens, in which case it would be easy to misidentify the sample. It is also possible that that the original collector was not skilled at botany and merely identified the sample incorrectly, erroneously labelled on purpose for the sale, or that the original identification was lost. There is no record of Constable purchasing *Danae* as a live specimen identified as *Ruscus,* although it may still be possible that the plant did grow within the grounds. There is a record of him purchasing six weeping willows (ERRO DDCC/153/52/16, 1761), however, in either case the live plants would be difficult to confuse with one another by a plantsman such as Constable. Therefore it is logical to conclude that Constable was taking receipt of samples as dried specimens which would later be reclassified by himself and his team.

This process reflects the method by which Constable created his wider cabinet collection. The same dealers that provided samples of pressed plants also provided thorough identification for fossil samples sent, as illustrated here by Da Costa in a letter from 1760,

> "The collection consists as per proposal, of 300 fossils, all curious and well chosen. each one is packt up in a paper apart, Mark't with the number on the Outside, and within,

[44] Alexandrian laurel

> with the fossil, each one has its label, with notice of what it is and its number again, and here included is another full catalogue of the whole Collection Number by Number." (ERRO DDCC/145/1, 1 July 1760)

Many of the fossils and geological specimens which remain in the collection today are still wrapped in paper bearing this information. If plant samples were coming from the same dealers it is reasonable to assume that many of the original herbarium labels may be in their hand. Equally, many of the fossils still have labels attached which bear Constable's handwriting (figure 42). This continued reassessment and labelling of samples draws direct parallels with the *hortus siccus*, again placing the plant collection within the framework of the cabinet.

FIGURE 42: GRANITE PEBBLE SHOWING WILLIAM CONSTABLE'S HANDWRITING ON THE LABEL (AUTHOR).

Constable clearly invested heavily in his plant collections, financially, in labour and in scholarly analysis. From the discussions above it is clear that this is in direct correlation with his wider collections, most notably those of natural history and the scientific instruments. This applies not simply to the contents, but also to the modes of construction. In very few estates in Britain do we see such clear and surviving evidence of links between these spheres of intellectual life. This is not to say that they did not occur, as the absence of information for plant collections and the tangible nature of art, furniture and durable collection pieces will undoubtedly skew a study of extant archives. For examples, while very little information is available on the plant collections of John Stuart, the third Earl of Bute, it is known that he kept a significant private collection of plants. Unlike Constable, however, the earl used his research to publish on the subject, producing his *Botanical Tables*, an extensive work in nine volumes published in 1785 which aimed to explain the principles of Linnaeus's taxonomic system (Pardoe, 2013). If, like Constable, the earl had not published, we may know very little about his plant collections despite his significant links with Kew Gardens. It is possible that there are more sites in the country which contained similar plant collections for study, but have been lost to history without evidence of publication or the survival of an ephemeral plant archive as at Burton Constable.

The examples discussed in this chapter offer a snapshot of some of Britain's *hortus siccus* from collectors of various backgrounds, but the extent of collections was certainly much greater. It can be seen that herbaria were kept by gentlemen, gentlewomen and professionals alike in the manner that they would keep a cabinet of curiosity, or later, a cabinet of natural philosophy, despite the fact that so many of those identified by Kent and Allen (1984) are now missing or unstudied. Robert James (1713-1742), the eighth Baron Petre's, little-known sixteen-volume herbarium, for example is now housed at the Sutro Library in San Francisco. A number of Petre's samples were collected by John Bartram, which arrived with the collector at Thorndon Hall by way of the merchant Peter Collinson (Schuyler & Newbold, 1987, p. 41). Further samples were from John Hill, who also collected for the Duke of Richmond at Goodwood, one volume consisting entirely of mosses (McLean, 1984, p. 37). Richard Richardson held an herbarium of his own, although no evidence remains, the collection having been dispersed after his death (Kent & Allen, 1984, p. 229). Other collectors who commissioned paintings also provide further evidence. While there is no evidence of a *hortus siccus* at Painshill, for example, within Charles Hamilton's library was found a "List of plants collected in Mr Hamilton's garden" and a case of drawings of flowers and shrubs (Symes, 1983, p. 113).

The *hortus siccus* and flower paintings were clearly a more significant item in the collector's natural history cabinet than has often been acknowledged. They provided durability for inherently ephemeral collections of exotic and native plants, and aided scientific study. In the context of John Evelyn, Laird (2015, p. 59) considers the cabinet of curiosity and the *hortus siccus* it contained as an effective strategy for preserving the miracles of nature. Bleichmar (2011, pp. 375-6) sees them as tools in the observation of plant science, noting that, "comparison was a multimedia affair, since naturalists contrasted live plants, dried specimens, printed and manuscript images, and textual reports".

The study of the *hortus siccus* is a valuable tool in our understanding of how plants and exotics were consumed in the eighteenth century. This resource provides a link between the spheres of eighteenth-century horticulture, the social and professional culture of natural philosophy, and the continuing desire to collect and order. Despite the ephemeral nature of the collections and the often haphazard recording systems, the mode of collection and presentation can assist our understanding of wider assemblages. While currently not comprehensively catalogued or recorded, our current level of knowledge can provide informative insights. Further study of surviving herbaria, particularly that of Sloane, could provide further information for scholars on social networks, horticultural growing practices and early scientific understanding.

Constable's *hortus siccus* provides a link between his garden and his house which is not often addressed in historical scholarship. This is a vital link. The house and garden are rarely considered as one entity, aside from discussions of architectural and landscape style. The parity

demonstrated here, between landscape, plant collections, collections of natural philosophy and both professional and amateur scholarship demands that a more holistic study is undertaken of collections and gardens in order to better understand the links between them, and the resulting ideologies which may be attributed to outdoor and indoor collections of plants, and therefore to gardens.

Furthermore, when the *hortus siccus* is considered as part of a natural philosophy collection, the available information and conclusions become enhanced and enriched. Constable's herbarium clearly demonstrates similar procurement practices to those of his wider collections. Some he collected and grew himself, but many came from dealers or friends, in a similar manner to his mineral and fossil collections, among others. The *hortus siccus*, however, being on paper, is easier to annotate, and notes are less likely to become detached from the subject as with other, solid specimens. The development of a collection and its attendant parts therefore become easier to map.

The ability to change and add notes to a *hortus siccus* can also assist our understanding. The progress of plant naming practices in this time of rapid and often volatile change maps the acceptance and implementation of Linnaeus' new principles of binomial naming, in addition to shedding light on the expertise of dealers, collectors, natural philosophers and gardeners. Additionally, the ability to shift and switch samples into new classification models maps the change in collection aims and practices throughout the century. Sloane's extensive collections could be particularly useful to this study, featuring, as they do, older assemblages which have been purchased and repurposed into wider collections with a different aim. This reflects the changing methods and objectives of natural philosophers from the seventeenth into the eighteenth centuries, through one set of artefacts. The study of herbariums is currently limited: a wider and more systematic study linking them to cabinet collecting would illuminate our understanding of collections, plants and gardens as integrated elements of an eighteenth-century representation of scholarship and identity.

CHAPTER 8: DISCUSSION

> "In his placing of the huge range of glasshouses on the west lawn adjacent to his new west front, he showed a lack of understanding of the underlying principles of landscape gardening"
>
> (Hall & Hall, 1991, p. 17)

In 1991 Elisabeth and Ivan Hall were able to confidently make the statement above, identifying the original siting of William Constable's stove garden on the west front of the house as a mistake. The inference is that the design of the parkland, based on popular stylistic trends, could be the only factor in determining the 'correct' siting of his stove and plant collections. The view is illustrative of the dominance of established approaches to garden history which prioritise aesthetic development. The consideration of design as being the dominant driver in the creation of eighteenth-century gardens has caused us to overlook potentially significant activities which may deliver new interpretations of the space. An improved understanding of the importance of plant collections and their distribution within the pleasure ground can shed new light on the ideologies of an owner and connect the study of the historical garden to a wider societal context. With its richly preserved archive, Burton Constable Hall provides a unique and enlightening glimpse into the methods and motives of a plant collector of the Enlightenment, and thus challenges many of the assumptions within traditional historiography of designed landscapes. This chapter will draw on the evidence presented in earlier chapters, along with theories of knowledge and collection to present an alternative interpretation of the horticultural activities at Burton Constable during the eighteenth century.

Studies of garden history often speak of the difficulties or conundrums of marrying the varying ideologies inherent in garden making; aesthetic, political, social, scientific, medicinal, health, nationalistic, practical, technological and environmental. In reality these are not distinct motives to be teased apart from each other and presented in isolation. They are inextricably linked into the creation of a space which is potentially more complex than any other sphere of life. The garden, its scale, the experience of it through social interaction, its functionality and its opportunity for discovery arguably represents a more diverse range of possibilities for human agency than architecture, art or science alone. So many influences converge on the garden, that it is a unique social construct of considerable complexity and artistry, and an arena of almost limitless potential.

The epistemological and scientific developments of the sixteenth and seventeenth centuries had highlighted that a scholarly approach to the world could bring economic advantage and worldly understanding. Being a part of this movement was desirable, entertaining, socially

engaging and provided an alternative set of social networks through which one's status could be negotiated and demonstrated. The recent work of Easterby-Smith (2018) has demonstrated that the nursery trade was active in stimulating scientific study in addition to aiding the development of new forms of social and economic commerce. The common threads throughout that work and this are the growing popularisation of scientific scholarship during the Enlightenment and the associated cultures of knowledge sharing with a focus on plant material. Viewing the procuration and display of vegetative material in this context provides a new framework within which to consider the role of plants in the garden. Additionally, the application of the theories of social construction of networks and identities from Swann (2001), Arnold (2006), MacGregor (2007), the emphasis on the experimental cabinet of experimental philosophy from Zuidervart (2013) and understandings of wonder and curiosity from Daston and Park (2001) provide a new lens through which to consider the impact of plants on eighteenth-century society. The trend for collecting and documenting the fruits of the garden are wrapped up in these constructs of society and identity, being borne of them and also driving them. The discussions of the previous chapters have highlighted how closely cabinet and plant collections were linked, and so how we must consider them within the same terms of reference, at least for the relevant segments of the garden. The introduction of histories of collection to an analysis of eighteenth-century plant cultivation has the potential to transform our understanding of stove and flower gardens of the period.

The period under discussion is well-documented in garden histories. The landscape style was dominant, but not the exclusive stylistic influence throughout much of the later century, whilst the exotic plant trade was booming. As seen in chapters three and four, this led to significant divisions of space within the estate, including specialist growing spaces, and a considerable investment in the skills and technology required to bring plants to flower and fruition. The practice was widespread, and many gardens can be seen to be representative of outdoor collections, showcasing the new and interesting, but also the medically, scientifically and economically important. Although not clearly visible in many garden histories, and not ubiquitous throughout the period, the specialist garden and specimen plants were a feature of many gardens, parks and estates.

The preceding chapters have documented the collections of the Duchess of Portland at Bulstrode Hall, which were extensive and admired by her contemporaries. Indeed, Stott (2013, p. 46) identifies the collection as a museum, rather than a cabinet, and ranks it alongside the Ashmolean Museum and the British Museum in terms of collections which embody the search for knowledge during the enlightenment. The duchess's collections perfectly reflect the problems faced by issues of preservation within this sphere. The lack of a surviving collection

or catalogue means that this impressive collection, perhaps the second-most extensive in the country at the time, is often overlooked, and none more so than the living plant collection. While the main body of the artefact-based collection was sold off after the duchess's death, the sale catalogue survives to inform us of the composition of the collection. Unfortunately, as Bulstrode Hall was largely demolished and rebuilt in the nineteenth century and little archival material remains, the detail of the garden layouts and the living plants contained within remain elusive. From correspondence and written records we can gain tantalising glimpses into what must have existed, but there are few details of such vast and significant collections. It is therefore very possible that plant collection practices were far more widespread than we currently understand, or that we may be able to understand through the surviving evidence.

The sample of case studies used in this thesis is by no means exhaustive. Further study may include a wider sampling of individuals whose gardens and collections are currently less well understood in relation to collections, gardens and botanical activity, including Cannon Hall in South Yorkshire, Goodwood under Charles Lennox, the second Duke of Richmond, and the Duke of Argyll's collections at Whitton. Likewise, numerous case studies have been presented in this study to illustrate the breadth and diversity of the collection of plants. They are not intended as a representative sample of collectors, however, as many enjoyed plants and gardens without the emphasis on collection. Of course, the landscape garden provided an expression of wealth and status, in addition to perhaps offering political messages as at Stowe. Others held impressive collections of plants in their gardens and on their estates, but did not engage in their systematic collection or classification in the same way as those discussed in this study. These included George William, 6th Earl of Coventry based at Croome Park in Worcestershire, who maintained an avid interest in plants in addition to an estate designed by Lancelot Brown. More than six hundred plant bills survive for the period from 1746 to 1816 listing thousands of plants that he purchased (Stone, et al., 2016, p. 9). These included trees and shrubs for the estate, but also plants for herbaceous borders and the hot house. The head gardener also received letters and advice from the nurseryman James Gordon (Stone, et al., 2016, p. 35). Despite this avid interest, it may be that the earl's interest was in cultivation and display; it is impossible to tell if it was linked to a collection of natural philosophy, a *hortus siccus* or paintings of the plants. It should not be assumed, therefore, that a significant living collection of plants automatically suggests a taxonomical interest and intention towards recording and classification. As in the world of collection and the diverse nature of the *virtuoso*, some collected scientifically, some fashionably. Both approaches, however, contributed to the construction of the owner's intended identity.

Therefore, the role of the plant collection was fluid, and may be used for a variety of purposes as trees on the estate, perennials and shrubs in the shrubbery, and choice specimens in the flower garden. They were flexible objects in the hands of their purchasers to bend to their

ambitions. They could be showy and on a grand scale planted for aesthetics, or rare specimen plants cultivated for their botanical interest and singular scholarly significance. As demonstrated, they frequently fulfilled both functions. Laird (1999, p. 222) has suggested that a mixture of both commonplace and curious plants represented in the Duchess of Portland's plant bills suggests that she was engaging in both ornamental planting and planting for botanical interest, and this was undoubtedly the case in many gardens of the period.

The breadth of motivations for the cultivation of eighteenth-century plants means that their study should be considered within the disciplines of both garden and collection history. The process of collection has been emphasised in this study, however, the more generally accepted influences on the history of garden making still apply. Economic opportunities, political signalling and social aims remain potential drivers of the construction of gardens as a whole. Inevitably these influences spread to plant choice and may have directly or indirectly impacted on the creation of botanical gardens. Certainly, the consumer revolution of the mid-eighteenth century impacted on the plant trade and the demand for horticultural goods. The influx of plant choices influenced the aesthetics of garden spaces, while at the same time these new markets and commodities were a significant driver of natural history as a discipline (Park & Daston, 2008, p. 14). The growth in plants as a commodity reflected and directed the rise of the object of curiosity for the cabinet collection.

We can usefully map the collection of plants to the history of collections by considering the changing relationships between cabinet objects and wonders from the seventeenth to eighteenth centuries. The sixteenth- and seventeenth-century tendency towards wonder in scientific endeavour came to be viewed as vulgar (Daston & Park, 2001), and a more considered and intellectualised form of collection emerged in the cabinets of the elite. The collection of plants certainly followed this tradition. Herbaria and plant portraits show a shift from the artistic representation of the wondrous and exotic, for example the early collections of the Duchess of Beaufort, to the scientific and ordered collection of material in a quest for knowledge, such as the collections of William Constable. The trends directly reflect Arnold's (2006, p. 3) observations of the shift towards classification as a core function of an eighteenth-century collection. The presence of exotics alongside native and unspectacular plants, both within gardens, dry collections and paintings follows the trend towards gathering items from familiar cultures in addition to those overseas identified by Impey and MacGregor (1985, p. 2). The criticism of Sloane's, 'wonderful' and largely unclassified collections by members of the Royal Society, highlights the change in attitude to collecting at the beginning of the eighteenth century: from eclectic assemblages of the curious, to cabinets for serious study. Collections based on wonder became commercial, theatrical opportunities (Purinton, 2007), but this was

not the label desired by those wishing to be associated with meaningful science. The collection of plants can be seen to follow the same methodologies exploited across the natural sciences and cabinets of experimental philosophy and the herbarium can help to build vital links which are missing due to obvious preservation issues.

The juxtaposition of the exotic and native in Constable's plant collections also follow this trend towards epistemological observation and strengthen the link to the cabinet and collection philosophy of the eighteenth century. This tradition can be seen in the vast majority of collections discussed in this study, including The Duchess of Portland, The Duchess of Beaufort, Fothergill, Richardson and Lord Bute. Constable's garden consultant, Thomas Knowlton, had a fondness for the native in addition to the exotic (Laird, 2015, p. 139), and it is likely that some of his enthusiasm rubbed off on Constable. The tradition of growing native plants and unremarkable specimens as collections is not well-documented, primarily due to the forms of evidence available for the plants grown within gardens. Visitor witness accounts tend to emphasise the remarkable, and catalogues such as *Hortus Uptonensis* (Lettsom, c.1783) do the same, although as proved in chapter four, this may not be representative of the live collections. Likewise, bills of purchase tend to favour the exotic; natives are more likely to have come into a garden through live collection or personal exchanges. Therefore, a history which concentrates only on gardens and surviving evidence for the plants within, rather than the wider social and scientific context may overlook a subtlety which betrays a vital function. Herbaria can help to remedy this situation by providing a picture of plants which were considered important in a thorough assemblage kept as a classificatory collection. That is not to say that natives were cultivated in all gardens in a botanical fashion, but if they were cultivated in gardens kept by collectors, then they could very easily be overlooked in the historical record. The Burton Constable collections shed fascinating light on the subject, as a holistically preserved archive.

Then as now, however, plants elicited a response in some people which transcended the scientific. Plants were beautiful, and new introductions were sought for both their scientific value and aesthetic interest. Few other commodities or curiosities have such a wide range of uses and social contexts. For example, geological specimens, shells, or historical artefacts remain static, as do the herbarium specimens. But unlike the static specimens, the source of those herbarium specimens is dynamic and changing, and, more importantly, had a purpose which was not scientific, and in this sphere, wonder was still permitted. Like collections of art, plants were aesthetic items to be gazed upon and wondered at, especially within the eighteenth-century frenzy of exploration and discovery. As with collections of scientific apparatus plats could create dynamic displays which would amaze visitors and provide discourse. Their partial removal from the spheres of purely scientific study allowed plants to

subvert the usual trappings of collection culture, and to be a distinct cultural element if the owner wished.

Constable's ultimate aesthetic or scientific intentions for his collections are not known, but were clearly based on the new science with a fascination for the new and exotic. It is possible that his intention was to publish, but the situation did not favour him doing so, or his experiments did not meet with enough success. He was heavily engaged in the "marketplace in ideas" identified by Porter (2003, p. 3), his extensive library, experiment machines and collections all linking him with and distinguishing him as a participant in the intellectual domain. The Linnaean system of classification had caused a revolution in the ability to order collections, and botanists were at the forefront of the move to using observation as a method of understanding the natural world (Findlen, 2008, p. 442). This meant that scholars with access to plants could place themselves at the vanguard of scientific thought. Some individuals such as John Stuart, the third Earl of Bute published and hoped to be seen as scholarly, whilst others used their collections as intellectual platforms, gathering information and sharing it, but also benefitting from that of others who were invited to observe, study, and bolster the image of the collector. Whatever the intention, the study of plants and botany fits neatly into Cooper's (2006) observation that the domestic sphere was a crucial site of knowledge making. The gardens of the wealthy became horticultural laboratories and opened up new social discourse.

The assimilation and consolidation of scientific thought (Porter, 2003, pp. 2-3), the popularisation of the new science and its adoption as a tool of social development and legitimisation by the gentry and professional class alike are all central to the discussion. Bleichmar (2011, p. 375) notes that the international collection-based network that connected naturalists, artists, physicians, colonial administrators and collectors around the globe, itself "affected the temporality and geography of [scientific] observation". Thus, the urge to collect and organise plants was an influence on the scientific process itself, as well as creating economic demand. The plant was then not simply an object acted upon by external social constructs, but an active agent involved in thriving economies and centres of knowledge building and scholarship. In this model, the garden becomes a locus of action central to the building of society, economy, relationships and identities which has potential to shed new light on the study of the landscape garden.

While social barriers remained along the lines of status and gender, it can be seen that within the study of plants these limitations were often breached. Easterby-Smith (2018, p. 6) has observed that, "the reciprocal relationships formed between traders, their clientele and their patrons impinged upon public participation in botanical science, influencing in particular ideas

about the social status and gender of the botanical scholar". Restrictions remained, but those with the means and skill to cultivate and record were encouraged, and welcomed into discussions which assisted in the development of the knowledge of natural philosophy. Swann (2001, p. 90) notes the case of amateur naturalist James Petiver (1665-1718), who, although the son of a haberdasher, could associate with men of a higher rank due to his status as a collector. This increase in social mobility in the eighteenth century was partly a result of knowledge sharing, and the society and coffee house culture. Outside the gentlemen's clubs, others including the Bluestockings encouraged the involvement of women like Margaret, Duchess of Portland who were also able to enter the intellectual sphere. As socially acceptable activities for ladies, collection and botany created a social shift within polite society in which women were able to become enablers themselves.

The study of botany and the cultivation of newly discovered plants was the preserve of the professional botanist and interested gentry alike. The latter are often referred to as 'amateurs' in discussion, but in reality the extent of their knowledge varied on a spectrum from social collector to noted expert. As related to the notion of the *virtuoso*, the term was applied to those who collected plants alongside other interesting categories of curiosities. In his *Eden*, in relation to the booming of the trade in exotics, John Hill identified that,

> "Plants are the proper Knowledge of the Gentleman, they will be treated in the Manner of Science; and he will be taught to Speak of them in proper Terms" (Hill, 1757, p. 1)

But also noting that,

> "...the spirit of curiosity is so far raised in many who have not Opportunities or Attention for the making themselves Masters of the Science of Botany, that the raising exotick Plants and Trees is become a very profitable Employment" (Hill, 1757, p. 680).

The professional and amateur structure of natural historical scholarship extended to the study of the science of botany perhaps more so than in other spheres, as the man-power, technology, innovation and wealth required to successfully cultivate many plants was vast. The cultivation of exotics in hothouses was the most concentrated sphere of investment, but even the cultivation of a large enough variety of hardy plants for study required land, time, investment and the employment of skilled workers. Linnaeus summed up the relationship between professionals and men of wealth effectively in his introduction to *Hortus Cliffortianus*,

> "...plants are scattered over the whole world. To hurry forth to the far-off Indies, to enter the New World, to strike one's head against the limits of the world, to view the sun where it never sets, this is not for the life of a single Botanist, or for his purse... He needs un-ceasing care, unceasing toil, unwearied diligence; for these ends not

> everyone's private means are sufficient, and among those to whom greater wealth has been granted, very few have sought their pleasure in plants.
>
> Everlasting among botanists is the memory of those Men of Wealth who have lent a helping hand to our art, who have been the lovers of the Science of Botany, enthusiasts, supporters, patrons. Those who have chosen this study as their hobby, natural, necessary, difficult as it is in the highest degree, will also attain to the highest degree of renown among posterity. Among us, therefore, great fame and undying renown attend all those who have devoted large fortunes, great care, and unceasing labour not merely to the collection of plants from every possible source, but also to their cultivation, to the description of their collections, to the publication of their descriptions throughout the Botanic world, and so to unique public service" (Linnaeus, 1737, translated from Latin and cited in Calmann, 1977).

From this passage, we learn that not all with wealth were interested in plants and botany, but for those like William Constable who were, it was a passion, as it was for the scholars and professionals. The study of botany depended on wealthy patrons; the study of live plants was much more difficult without their investment. Similarly, finances were needed for collecting trips, or to enable collectors, travellers and merchants to transport specimens home successfully. The Royal Society's view of collection as something in which anyone could successfully engage took advantage of the rural seats of the elite as domestic centres of experimentation (Wood, 1980, p. 20). The wealthy, like the Duchess of Beaufort, the Duchess of Portland, the Earl of Bute and William Constable were able to invest time, money and skilled labour into the collection and cultivation of both native and exotic plants. They enabled voyages of discovery, bought from the thriving nursery trade, built and maintained stoves and greenhouses, employed the most skilled horticulturists, and used portions of their gardens and estates for the growth of hardy plants in a systematic manner. They made links with the great thinkers of the day and facilitated their knowledge by providing a plethora of items for study.

The reciprocal relationship of the elite with respected professionals validated their collections and scientific knowledge. Having Banks, Dillenius and Solander enjoy and study your collections was something to be proud of and spoken about at length. The frequent mentions of discussions and study in the Duchess of Portland's letters clearly identify knowledge as a commodity to be proud of and utilised for social gain as well as to be enjoyed and shared. She was associated with the work of eminent scholars by enabling the cultivation of specimens they would not otherwise have been able to view, building for herself a legacy which was unusual for her gender within this period.

In a time of such frenzied classification, links with the eminent botanists engaged in designating the future nomenclature of the natural world had further potential for notoriety. In a letter to Carl Linnaeus James Lee wrote that,

> "Lady Anne Monson… has Charged me to give her best compliments & thanks to you for the honour you have done her in giveing her the name of Monsonia speciosa, and that you may depend on her being a gratfull Correspondent as soon as her afaires are so settled that she has time to turn her thoughts to Natural History" (Linnaean Society, n.d.)

The two types of interested parties enjoyed a mutually beneficial relationship. The gentry often utilised the knowledge of the professionals to organise their assemblages, to imbue them with meaning and possibly even to recognise them for posterity, and the professionals benefited from the wealth and land of the patrons which helped to provide their material for study. For the professionals, membership fortified their reputation (Hanson, 2009, p. 9), and for the gentlemen membership validated their status as an individual of knowledge and learning and patrons of the new natural sciences. Many gentlemen and patrons saw themselves as botanists, such as William Constable and Lord Bute. Joseph Banks was a baronet who made the transition to celebrated naturalist and figure of international scientific significance by his place as the naturalist on a number of worldwide voyages, most notably on the Endeavour (Gascgoine, 2013). The links forged between groups determined a new structure for the formation of knowledge and fanned the flames of the popularisation of science and natural philosophy throughout the Enlightenment. In this way plants may be added to MacGregor's (2007, p. 66) theory that the increasing mobility within social networks was enabled by the construction and analysis of cabinet collections. It was this structure in which the collection of plants thrived and evolved, and which also sets it firmly in the tradition of cabinet collecting for both wonder and classification.

These social structures of mutual benefit which surround cabinet, and therefore plant collections, fit neatly into Swann's (2001) observations that collections were effective forms of fashioning social authority for the mercantile and artisan classes in the early modern period, and also that natural history collections were successful means of creating social groups. She argues that the early modern collection was intrinsically social, a means of creating new social formations and an identity for an individual (Swann, 2001, p. 96). Botany's position at the forefront of science and intellect, the ability to present impressive objects, extensively catalogued collections or new knowledge would have made plants central agents within this structure. When considered in the context of the cabinet collection, the cultivation of plants can also be seen to be a means of fashioning the self.

William Constable's social rank, his Fellowship of the Royal Society and interest in collection was typical of the day. His subscription to the Royal Society without making any particular contribution to the advancement of science was typical of the gentlemen identified by Coulton (2011) who entered the society to augment their public status through socialising and patronising the researchers of lower ranks. This echoed the tradition of subscribing to a book, an activity he engaged in later in life, using one's wealth and patronage to further knowledge, and enjoying the fruits of this investment in the form of an improved understanding of the world and a boost in social status and visibility. Thus, Constable's involvement in the scientific community was one of patron, but it was not as straightforward a relationship as this. The collection of plants, herbarium specimens and exotics entertained him and his guests, but also advertised his own scholarship and his involvement in the popular new science.

Constable's stove and stove garden in which he collected and classified both tender and hardy plants can clearly be seen as an exterior locus of his cabinet of natural philosophy. Within present definitions of eighteenth-century gardens it would most accurately be classified as one of Mark Laird's flower gardens (1999, pp. 12-13), a space where beautiful or specimen plants were cultivated. The flower garden can now be seen to have an inextricable link with wider collection ideology, and therefore a far broader social impact than has been previously imagined. The plants they contained were agents of social change through the fashioning of personal identities and the instigation of new social structures. It is hoped that future discussions of the use of space within a landscape garden will consider the possibility that botanical cultivation may have been an objective. With further nuance and emphasis on those flower gardens which served a primarily botanical or experimental functional, this concept has the potential to transform a traditional reading of space division within the pleasure ground.

Discussing trends in plant collection alongside those of wider cabinet collections makes clear the obvious parity between them, in terms of acquisition, structure and knowledge generation. With reference to theories of natural philosophy and collection, it can be considered that plants were not simply passive elements of the aesthetics of a landscape, they were significant components of natural history collections, and therefore active agents in the processes of identity building and social engagement. They helped to enable social networks, and the houses of the elite became a focus for horticultural study and experimental laboratories.

The landscape garden had emerged as a concept in response to many drivers, one of which was the growing respect for, and cultivation of, the idea of nature (Symes, 2016, p. 1). The adoption of this fashion was by no means antithetical to the pursuit of natural knowledge and science in the garden. While the structures and cultivation areas involved required a more ordered

structure which did not conform to the fluid lines and open spaces characteristic of the landscape style, they may be enclosed or secluded in a way which minimised their impact on the broad aesthetic. Equally, the considerations of the landscape style may be overlooked in the preference for the pursuit of different priorities, for example holding plant collections nearer to the house as was the case at Wroxton Abbey (Edwards, 1986), Cannon Hall (Laird, 1999, p. 303) and Burton Constable. The presence of such strong botanical motivations in the flower gardens of the gentry necessitates that their significance is considered anew, and alongside collections of natural philosophy.

Referring back to the quote with which this chapter began, it is now possible to see Burton Constable from a new perspective. Rather than Constable's deviation from the norms of the Brownian layout of parks representing a lack of judgement on his part, it is possible to identify purpose and motive for locating the hot houses and plant collections on the west front of the house. Establishing plant collections as active agents of identity creation and tools for social gain allows them to be viewed as central features around which the design was created. The proximity to the house would have allowed Constable easy access to the collections for study and pressing for the *hortus siccus*, and was in easy reach of entertaining rooms for guest visits. The fact that it was perfectly located to be directly visible from his museum and experiment rooms effectively linked his natural cabinet collections both inside and outside the house, allowing a visitor to marvel at the full extent of his mastery of natural philosophy. The placing of the stove and stove garden immediately next to the house was no mistake, it was a deliberate and conscious expression of Constable's aspirations for his own identity, as a fashionable and learned gentleman.

CHAPTER 9: CONCLUSION

Within their component parts the garden and collection at Burton Constable are arguably unremarkable. The landscape was in part redesigned by Lancelot Brown, a stove was built to successfully grow tender plants and the grounds held hardy ornamental plants whilst Constable kept a philosophical cabinet including a *hortus siccus*. All of these elements were replicated many times over across Britain. The significance of Burton Constable is in the consistency of the evidence, enabling comparisons to be made across landscape and collections on one site. The records of purchases enable an insight into living plants which are now lost, and Constable's correspondence offer a glimpse into the processes and motivations which surrounded his collections. On this site we are able to discern how these spheres of life overlapped, complemented each other, and shaped both the Burton Constable landscape and William Constable himself.

Constable's priorities changed over time, although curiosity, beauty, exotics, science and status endure as continuing themes in his life, blended in different measure. The zenith of his garden and collection activity came in the 1750s and the 1760s, his stove, botanical garden, *hortus siccus*, cabinet collections and experiment room clearly defining his lofty intentions in the new sphere of natural philosophy. His attempts to cross a rabbit and a chicken and the enthusiasm with which he pursued Jean Jacques Rousseau further outline the scientific and philosophical motivations which structured his life. As his health deteriorated and an active lifestyle became less possible, science and collection were pursued less urgently but it is clear that these remained important concerns throughout his life and he continued to visit the collections of others. As the urge to have his plant collections close by lessened, the impulse to create a fashionable landscape grew. Lancelot Brown visited the garden regularly to advise on developments and Constable took heed, although with a twist of his own, supplementing Brown's usual native plantings with a rich plethora of exotic trees.

A comparison with other case studies, both earlier in date and contemporary with Constable, show that he was by no means alone in his lavish efforts to collect, classify and experiment. The popularity of Baconian inductive reasoning, observation and experiment, coupled with the rise in the availability of printed material and the mobilisation of knowledge within the coffee house and learned society, led to a boom in the study of natural philosophy. The vast quantities of new and unfamiliar material arriving from newly discovered lands held untapped medicinal, economic and aesthetic potential and needed to be understood and classified. The volume of introductions and increases in trade by skilful nurserymen also drove this material and associated scientific knowledge to a wider range of society (Easterby-Smith, 2018). For those

involved in classification, it meant new social possibilities, new connections and the opportunity to define oneself against a personally-selected set of concepts and values. The process of collection allowed an individual to engage with new sectors of society and opened up new avenues of social mobility wherein professionals and the elite could engage in productive discourse. It allowed knowledge to be shared and traded for increased social and economic opportunity.

The rise of intellectualism within these coffee houses produced a social behaviour and process which implicitly structured the pursuit of natural philosophical knowledge towards the end of the early-modern period (Coulton, 2011, p. 43). Knowledge became a social currency. Wonder at the exotic and amazing became vulgar, replaced by a new natural philosophy and curiosity for an understanding of process, principle and empirical observation. The country seats of the gentry were the perfect place for experimentation, and the domestic space became an arena of study (Cooper, 2006). Constable's scientific instruments in addition to his museum and experiment room make this concept visible at Burton Constable, and his stove garden was an extension of this domestic experimentation space. Plant knowledge was being furthered in the homes of the elite, often aided by visiting professional botanists. Linnaeus's sexual system made the classification, and therefore the systematisation of nature easier and more accessible to a wider audience. Botany was not following the wider natural philosophical trend: it was leading it.

The changes in plant collections over time, as evidenced in the case studies presented, can be seen to follow the subtle transition from natural history to natural philosophy, and from wonder to empiricism. The Duchess of Beaufort's plant collections and florilegium show little structure, but offer an artistic insight into the fascination of the curious. Even in the early-eighteenth century, however, her recording of propagation and cultivation methods offered an early precedent for the structured experiment which was to come. Her contemporary, Sir Hans Sloane, built perhaps the greatest curiosity cabinet ever to exist, but with little attempt at systematisation or classification and was occasionally accused of collecting for wonder and exoticism.

The change in ideology of the later collections which have been discussed is notable. Following the shift in culture towards empiricism, away from the curiosity cabinet to one of natural or experimental philosophy, collections of artefacts and plants see a greater variety of specimens and an increase in classification. The inclusion of native species of plants in a *hortus siccus* to provide complete classifications and comparisons with exotic specimens highlights that these changing collection philosophies impacted on, and indeed were led by the plant and botanical world. The collections of the Duchess of Portland, Dr John Fothergill, Richard Richardson, the Earl of Bute and William Constable clearly demonstrate the intellectual endeavours inherent in

the construction of their cabinet collections. Constable's collections show a notable leaning towards plants which were not just beautiful, but also botanically and economically significant. Discussions with Da Costa highlight that Constable was keen to be viewed as a scientific collector, not simply a fanciful collector of curiosities. He revelled in the company of philosophers like Rousseau and was a member of the Royal Society. His scientific equipment and the proliferation of native plants both pressed and living bear testament to this ideal.

One striking observation in the study of these particular collections is of their very ideosyncratic character. Each collection was defined by its owner, whether by their personal interest, their financial and physical means, their contacts and their social aspirations. In addition to creating new social networks and a new class identity, collection allowed each collector to construct a uniquely individual self within the social group (Swann, 2001, pp. 8,78,96). Collections were a social transformer; a dynamic agent of the creation of society and of a personal identity.

William Constable's collections, allied with contemporary case studies, enable a closer consideration of the position of plants within this structure. Constable's *hortus siccus* has been shown to have been created along the same ideological and physical lines as the wider cabinet collection. His outdoor, living collections were also created and recorded in the same manner, and fed the dried collections. Although these links cannot be demonstrated so clearly in the collections of others including the Duchess of Portland and the Earl of Bute due to the poor survival of evidence, the information which does survive strongly suggests that they follow a similar pattern. Kent and Allen's (1984) identification of 353 known herbaria from the seventeenth and eighteenth centuries supports the view that the *hortus siccus* was a vital tool for any plant collector. This study places living collections, dried plant collections and cabinet collections within the same ideology, and therefore demonstrates that plant collections were implicit in the creation of new societal structures, and the creation of personal identity for the owner. The plant collections, therefore, inhabited a central space within the eighteenth-century pleasure ground.

At Burton Constable, aesthetics and collections coexisted; Brown acted as an advisor, his instructions interpreted in a way which fit the character of the garden and the motivations of William Constable. Constable found a happy compromise, a way of reconciling his social status, his personal interest and his scientific credibility into a working model of house and landscape. His objectives complemented one another, and he achieved both an indulgence of his passion, and a meeting of social expectation. The landscape garden did not negate the presence of the new science within the garden. If an owner required it, the two may happily coexist. The model is represented within our other case studies, the fashionable landscape also allowing for the specialist cultivation of specimen plants, a more prominent feature of gardens than often recognised. This consideration allows us to build on the work of Williamson (1995), Laird (1999)

(2015) and Symes (2016) and should be taken into account in any future discussion of the eighteenth-century ornamental landscape. New light can be shed on Laird's (1999) concept of the botanical garden, and the variety of the contents, structures and objectives which were embodied within its walls.

The uniquely surviving evidence for the juxtaposition of various motives of the house and garden at Burton Constable throws a fascinating light on other country houses of the period. At Burton Constable they build a picture of a man defined in large part by his collections and his garden, the two linked ideologically and aesthetically by a direct view from his museum room within the house to his stove garden directly beyond. To the visitor, he allied himself firmly with the new, systematic science which had already offered so much advantage to the world and offered a bright future if it could be further tamed and understood. The link between the plant collections and other spheres of life is clear. They were not passive objects to be enjoyed only in the garden, but active agents in the creation of Constable's self and his position in the social world. They linked him to a transformative tradition which was to shape the future and provide its participants with a place in history.

Scholarship of gardens and flower paintings has traditionally tended to focus on the aesthetic, whilst scholarship of plants and herbaria has been predominantly botanical. Through a study of the grounds and collections at Burton Constable Hall, alongside comparative collections from varying social sectors, this thesis has aimed to show that science and aesthetics are not always separable in the study of eighteenth-century gardens and collections, but that one – the former – has been badly neglected. Often, the two influences developed as interwoven pursuits, married in the eyes of their owners, and therefore impossible to extract in modern scholarship. The picture is complex, the various case studies presented highlight that individual identity was a goal, and that one, ubiquitous interpretation of gardens and collections should not be a fundamental aim. Plants were active agents of knowledge development at the vanguard of scientific thought and the social dynamic which it generated. Gardens were enablers of scholarship, and by default became agents of personal identity, social change, economic advance and scientific experimentation. Considering the garden and the *hortus siccus* in their wider context allows us to move closer to an understanding of their true impact on the physical and intellectual landscapes of eighteenth-century Britain.

APPENDICES

APPENDIX 1

PLANT PURCHASE LISTS

Plants purchased from Christopher Gray March 3rd 1759:

1 Magnolia
1 Fig apple
1 Moon seed
1 Neopolitan Medlar
1 Gooseberry leaved Haw
1 Large Azorole
1 Small Virginia Dº
1 Christ thorn
1 Groundsel Tree
1 Scarlet Horse Chestnut
1 Olive leav'd Phillyrea
1 Privet leav'd Dº
1 Prickly leav'd Dº
1 Rosemary leav'd Dº
1 Prinos or winter berry
1 American Oak
6 Sumach, 1 of a sort
1 Common acacia
1 Evergreen Sw.t Briar
1 Tantanian[?] Scarlet Spirea
1 White Dº
1 Single virgins bower 1 each
1 Peacock[?] Bladder Senna
1 Oriental Dº
1 Coccygria
1 Area[?] theonphraste
1 Sorbus with Arbutus leaves
1 Scotch Laburnum
1 Dier vila
1 Pishamin plum
1 Indian Date Plum
1 Carolina Shrub Trefoil
1 Siberian Cytisus
1 Dble Spanish Broom
1 Anona or Papaw Tree
1 Hamamelis
1 Lentiscus
1 American 3 leav'd Sumach
1 Sin Charless Maple
1 Virginia Scarlet Dº
1 Trible thonrd acacia
1 Montpelier Maple
1 Silver Stripd Phillyrea
(ERRO DDCC/153/51/14, .)

1 Gold Stripd Phillyrea
1 Stripd Cut leavd Dº
1 Dble Dwarf Almond
37 Hollys of sorts
1 Greater Portugal Broom
1 Dahoon Holly
1 Angilica Tree
3 arbutus 1 of a sort
1 Bastard Indigo
2 Trumpet flowers 1 Each Sort
1 Catalpa
1 Cashioberry bush
1 Casine or happon
1 Euonymus Scandans
2 Nettle trees 1 Each sort
1 Deciduous Cypress
1 Stripd Laurustinus
1 Caroline Tinus
2 Tulip Trees
1 agnus Castus
1 Cork Tree
1 Iris livania[?]
1 Fennel Giant
1 Evergreen Euonymus
1 Broad leavd Euonymus
1 Liquid amber
1 White Spanish broom
1 Cinquepin Chesnut
1 Azedrick or bead tree
1 Ditany of Mont Sephilus
1 New Casine or Hyson Tea
1 Duke of Argyles Tea
1 Broad leavd Licium
1 Sw.t Scented Toxiodendron
1 Catalonian Jasmine
2 Stripd Myrtles
1 Supple Jack
1 Carolina Bay
1 Oak leavd Candleberry Myrtle
1 Virg. 4 leavd Trumpet flower
1 Stripd Candy Tuft
4 Baskets
5 Matts

APPENDIX 2:

THE DUCHESS OF PORTLAND'S SURVIVING SPECIMENS AT WELBECK

Source type	Content	Detail
Voucher **Welbeck Inventory number 20419**	Paintings by Taylor (3)	**Painted by Taylor Jan 11 1779** Daphne laureola Daphne mezereum Silena armeria
	Paintings by Ehret (9)	**by Ehret** Ranunculus aquatilis Scrophularia nodosa Melampyrum sylvaticum Oenanthe crocata Matricaria maritima Cotyledon umbilicus venericus Fumaria claviculata Draba muralis Erysimum alliaria To 3 plants by Taylor - 3:3:0 To Finishing 9 by Ehret - 4:14:6
List of plants	Plant names	Pale blew toad flax Cymbalaria sharp pointed fluellin (?) - 6.7.R Snap dragon - 1.2.R Fig Wort - 1.2. R Purple Fox glove Yellow Rattle Red Rattle Eyebright Common cow wheat Milk wort Red, blew & White Broom rape Inchanters nightshade Wall flower Common Whitlow grass Shepherds purse Jack by the hedge Tower'd [?] mustard Charlock Hedge mustard Ladies smock Water [?] Horse Radish Dittander
List of 7 plants, numbered	List of 7 cranesbills with short descriptions	
List of plants	List of plant sketches, unauthored	1770 A catalogue of the Sketches of Plants done for her Grace the Dowager Duss. Of Portland at 7 shill: each including the Vellum 1. Veronica Serpillifolia 2. Veronica Chamaedris 3. Veronica agrestis 4. Veronica hederifolia 5. Valeriana dioica

Source type	Content	Detail
	List of plant sketches, unauthored (cont.)	6. Claytonia 7. Saxifraga a particular Spec. 8. Cerastium with a large flower 9. Empethrum nigrum Crow berries 10. Euphorbia Amyggdaloides 11. Chenopodium bonus Henricus 12. Ophris the yellow flowered from Portugal 13. Ophris from Portugal 14. Tussilago Butter-bur 15. a variety of the man Orchis with a ferrugineous flower 16. Graphalium dioicul 17. Arenaria saxatilis 18. Euphorbia portlandica 19. Trifolium filiforme 20. Saxifraga pensilvanica 21. Trifolium subterraneum 22. Polygonum viviparum 23. Geranium sylvaticum 24. Rosa scotica 25. Silene nutans 26. Tormentilla reptans 27. Hipuris vulgaris 28. Apple bearing rose 29. Lady Hamford's rose 30. Buxton rose 31. Mr Bank's Pink 32. Fountain Abby Pink 33. Alexanders 34. Golden Lungwort 35. Roman nettle 36. Evergreen speedwell 37. Anthericum assifragum Lancashire Asphodel 38. Allium fr Wm 39. Solidago virga aurea 40. Oenanthe crocata 41. Beta maritima 42. Annual sedum 43. Silene noctiflora 44. Norfolk mullein 45. White mullein 46. Sheep scabious 47. Allium oleraceum 48. Glastenbury vetch 49. Lyndium latifolium 50. Scochis Germnica 51. Fir-leaved heath
Paintings	31 Watercolour paintings of plants Highlight indicates sketches mentioned on unauthored plant list above	Aegopodium Pedagraria - Herb Gerard Arenaria saxatilis Pedicularis sylvatica Convallaria majalis Primula veris. Ver. B. Huds: Astragalus glycyphyllus Ranunculus Ficaria. Lin. Crysosplenium oppositifolia Primula veris Montia fontana Genista tinctoria Crysosplenium alternifolium ? Hybrida

Source type	Content	Detail
	31 Watercolour paintings of Plants (cont.)	[no name] ? moonplant [?] ? Fragaria sterilis Fragaria vesca No name No name Cerastium arvense Euphorbia amygdaloides Trifolium filiforme Trifolium subterraneum ? Nettle? Smyrnium olusatrum Alexanders Anthericum assifragum Allium fr. Wm. Norfolk mullein Verbascum Thapsus
Herbarium **Welbeck Inventory number 20420**	Collection of herbarium specimens. 60 mounted	Lavandula spica. Lavande Mercurialis annua (male). Stellaria holosteum Ornithogalum umbellatum Saponaria officinalis Hyacinthus racemosus Najas marina (female) Vicia cracca Tanacetum vulgare Medicago sativa Asclepias Vinuloxium Lin. Thymus serpillum, varietas. Lin. Sisymbrium Sophia Lin. Myagrum paniculatum Lin. Punus Mahaleb. Lin. Pyrola rotundifolia. Lin. Linosyris chrysocoma. Lin. Stachys palustris. Lin. Gentiana verna. Lin. Genista sagittalis Lin. Melittis Melissophyllum Lin. Mespilus Amelanchier. Lin. Chamedrys officinalis. Lin. Stellaria dichotoma Lin. Pyrola Secunda Lin. Serapias Helleborine Lin. An Senecio viscosus Lin. Geranium moschatum Lin. Callitriche verna. Lin. Osmunda Lunaria. Lin. Fumaria bulbosa. Lin. Teucrium Botrys Lin. Veronica maritima Lin. Teucrium Scordium Lin. Thalictrum lucidum Lin. Digitalis lutea. Lin. Valeriana montana Lin. Phyleuma Orbicularis Lin. Thesium Linophyllum Lin. an Hieracium Sabaudum Lin. Laserpitium latifolium Lin.

Source type	Content	Detail
	Collection of herbarium specimens. 60 mounted	Teucrium polium. Lin. Sagina procumbens Lin. Spergula nodosa Lin. Epilobium palustre Lin. Var. B. angustifolium Lin. Sherardia arvensis. L. Asperula Cynanchica. Lin. Astrantia major. Lin. Chaerophyllum hirsutum. Lin. Asperula odorata, Lin. Ranunculus hederaceus. Lin. Scleranthus annuus. Lin. Teucrium Chamapytis. Lin. Coronilla minima. Lin. Andropogon Ischamum Lin. Erigeron acre. Lin. Clypeola maritima Lin. Adoxa moschatellina. Lin. Prenanthes purpurea. Lin. Spiraea aruncus. Lin.

APPENDIX 3:

CATALOGUE OF WILLIAM CONSTABLE'S HORTUS SICCUS

Picture references to files on memory stick. W.C. refers to William Constable.

Volume IV

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Met Varia some transcribed [above on square note, separate] Aster folius ovatis rugosis subtis tomentosis amplescieaulibus, Calyeum squamis ovatis patulis. Linn. H. Cl. 407. Moyen 166. ... omnium Maximus Helenium dietus. Tourn inst. 488. Starwort	1	1003	
		Mst WC 4 hack Notce from no. 3 to 7 Some not hanscribed [above on square note, separate] Aster. Starwort	2	1004	
		Helianthus radice tereti inflexa percunni. Linn. H. Cl. 419. Corona = solis perennial, flore et semine maximis. Tourn Mst. 489. ..... Ramosa percnnis. Boerh. Lugdb. 1.p.102. Soleil Everlasting Sunflower	3	1005	On separate sheet - 3. Polygamia frustranea
		Trifolium Sea starwort Aster maritimus Caeruleus Tripolium dictus. Pray syn. Ed. 3. 175. Tripolium majus et minus. J. Po. 12. 1064. Plant. Hibern. ... vulgare majus et. Minus. Ger 333 ... majus five vulgare, et. Minus. Park 673. ... majus coruleum et minus. Aster folius Caneeolatis glabris, ramnis in aquatis, floribus Corymbosis. Sea Starwort. Mr Hill 1746. by the Thames side beyond Greenwick.	4	1006	
		Chrysanthemum foliis Amplexicaulibus Superne Caeiniatis inferne dentata serratis. Linn. H. Cl. 416. ..... Legetum, faeie Bellidis sylvestris, folus Glaneis, papaveris hortensis in star profunde in eisis, majus. Herm. Lug (?). 145	5	1007	
		Chrysanthemum. Corn Marigold with a fever few leaf [on loose note] Chrysanthemum folius pinnatifidis ineifis extrorsum Catioribus. Linn. H. Cl. 416. .... Folus Matricaria flore aureo ..... Folus Matrieana. Bauhin. Pin. 134. From Giles's Garden July 1748	6	1008	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Chrysanthemum. Corn Marigold of Crete [on loose note] [etc] from the Garden of the Palais D'orleans. Paris. 1742.	7	1009	
		[etc] Matricaire feaver few. Motherwort	8	1010	
		Achillia Millfoil Double. Or double sneeze wort. [on loose note] Matricania flore pleno. Bauh. Pin. 134. I.B.3.130 From Lord Petres. 1749	9	1011	
		Buphthalmum Caule ramoso, [etc] Oeil de Beuf oxeye Daisy	10	1012	
		[etc] Camomile Camomile High Paris. July 1742	11	1013	
		Anthemis. Corn Camomile. Hudson 324. [loose] Anthemis [descriptive]	12	1014	
		Achillea folus duplicato [etc] [descriptive] Millefeuille Millefoil or yarrow	13	1015	
		Leucanthemum vulgare [etc] [descriptive] Grande paquette, marguerite great oxey daisy from a meadow beyond lane wood from Hamstead June 1746	14	1016	
		Bellis [descriptive] Paqueertteron Marguerite the lesser Daysie High London Aprill 1748	15	1017	
		Tagetes caulo [descriptive] Oullet d'Inde African Marygold	16	1018	
		Rudbeckia folus [descriptive] Lord Petres's 1745	17	1019	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Rudbeckia Dwarf Sunflower with entire leaves [loose] Rudbeckia folus [descriptive] Lord Petre's 1745	18	1020	
		Rudbeckia. Dwarf sunflower with Large Flowers [loose]		1021	No sample
		Centaurea Common Corn Bottles [loose] Cyanus flore [descriptive] Purple Bottles Mr Baker [second sample] Centaurea calycibus Bleuet Blew Bottles Mr Baker	20	1022	Two samples on one sheet
		Centaurea. T Barnaby Thistle. Hudson 326. [loose] Centaurea calycibus [descriptive] Between Vanguard x Meudon on the road side about a league & a half from Paris	21	1023	
		Centaurea. Common Knapweed or Marfellon. Hudson 326. [loose] Centaurea [descriptive] High London. July 1747.	22	1024	
	4. Polygamia nueflaria [loose]			1025	
	5. Monogamia [loose]	Jasione folus [descriptive] Raiponce Hairy sheeps scabious, or rather Rampions with Scabious heads. Found on a place near Paris Call'd the Butte de leve on des Anglois. July 1742.	23	1026	
		Lobelia Rapuntium [descriptive] Rampions from St. Leger 14 Leagues from Paris. Augt. 1742.	24	1027	
		[two on one sheet] Viola acaulis [descriptive] purple or sweet violete on the bank of a little running water on this side of Kentish town. March 1747. [second sample] Viola acaulis… [descriptive] white sweet violet. From a garden. March 1747.	25	1028	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		[two on one sheet] Viola caulibus... [descriptive] Violette sauvage Marek wild violet without smell [second sample] Viola martia... [descriptive] Both high Paris 1742.	26	1029	
		Viola. Sweet white violet. Hudson 330 [loose] Viola martia alba. Bauh. Pin. 199	27	1030	
		Impatiens pedunculis [descriptive] Balsamine a fleur blanche white balsam	28	1031	
		Impatiens pedunculis [descriptive] Balsamine a fleur rouge scarlate Scarlet balsam	29	1032	
		Spotted handed mountain white orchis from hamstead heath June 1746. Orchis palmata [descriptive]	30	1033	
		Orchis palmata montana maculata [descriptive] Anglice mountain spotted hand orchis	31	1034	
		Orchis palmata [descriptive] The male handed orchis, or male Satyrion Royal from the park if Meaudon, near Paris June 1742.	32	1035	
		Hm. Orchis	33	1036	
		Orchis palmata [descriptive] Sweet smelling Satyrion. Or Orchis. From the forest of montmorency. July 1742	34	1037	
		Serapias Caule Multifolia [descriptive] Elleborine Bastard Hellebore with white flowers. From Mendon. July 1742.	35	1038	
	2. triadria			1039	
		Sisyrinchium caule... [descriptive] From Mr Gordon's Garden at Mile End. Aug. 1746	36	1040	
	3. tetrandria			1041	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV	4. pentandria			1042	
		Passiflora... [descriptive] Granadille. Fleur de la passion. Passion flower. Augst 1748.	37	1043	
		[two samples] Passion flower. Passiflora Agnus castus. Vitex	38	1044	
		Aristolochia caule [descriptive] Aristoloche Clematite Creeping Birthwort From Thorndon Garden. June 1746	39	1045	
	2. tetrandria			1046	
		Sparganium [descriptive] Burr Reed from the pond in the wood of Meudon. July 1942.	40	1047	
		Sparganium. Great Burr-reed. Hudson 346. [loose] [descriptive]	41	1048	
		Typha.. [descriptive] Cats tail from Meudon July 1742.	42	1049	
		Buxus... [descriptive] le Buis the Box tree	43	1050	
		Strip'd box [loose] [two samples] Buxus.. [descriptive] Buxus... [descriptive]	44	1051	
		4. Pentandria		1052	
		Amaranthus tricolor flower gentle. Millr. [loose] Amaranthus... [descriptive] From Mr Giles's Garden. July 1747.	45	1053	
		6. polyandria		1054	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Fagus... [descriptive] Chestnut tree. From the forest of Mount morenay July 1742.	46	1055	
		Carpinus. Horn or hard beam tree with variegated leaves. [loose] Carpinus squamis... [descriptive] Lord Petres. June 1746.	47	1056	
	7. Monadelphia			1057	
			48	1057	Conifer sample, no notes
		Cupressus. Cypress. Deciduous [loose] Cupressus... [descriptive] From Lord Petre's. June 1746	49	1058	
		Cucurbita...[descriptive] Calbasse longue Long gourd	50	1059	
		Bryonia [descriptive] White bryony Mr. Baker	51	1060	
		page of writing		1061 and 2	
		Salix... [descriptive] the most common white willow. On the bank of a running water going to Kentish Town. April 1747.	52	1063	Male and female samples
		Salix willow	53	1064	
		Hippophae...[descriptive] Sallow thorn or Sea Buckthorn on the coast of France opposite Boulogne. August 1749	54	1065	
		Viscum... [descriptive] Gui Mistletoe from St Maur high Paris. June 1742	55	1066	
		Myrica... [descriptive] Gale Sweet willow. Gaule or Dutch Myrtle From St Leger 14 leagues from Paris. Augst 1742	56	1067	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Cannabis...[descriptive] Male hemp	57	1068	
		Cannabis...[descriptive] female hemp from St leger. Augst. 1742.	58	1069	
		Cannabis... [descriptive] Hemp of Crete from Lord Petre's 1745	59	1070	
	7. Enneandria			1071	
		Mercurialis...[descriptive] Mercuriale French mercury male and female Blue green Hammersmith June 1746	60	1072	
		Mercurialis... [descriptive] dogs- mercury Mr. Hill. May 1746	61	1073	
	11. Monadelphia			1074	
		Juniperus...[descriptive] Savin	62	1075	
	12. Syngenetia			1076	
		Ruscus... [descriptive] Knee = holm or Butcher's Broom From Barrham wood. February 1745	63	1077	
		page of writing		1078	From Genera Planarum
		Veratrum..[descriptive] Ellebore Glane a fleur rouge = brun white Hellebore with a dark red flower	64	1079	
		Parietaria...[descriptive] Pellitory of the wall	65	1080	
		Atriplex..[descriptive] the longest and narrowest leaved Orrache Mr D'Acosta 1746	66	1081	
		Orach [loose] Atriplex... [descriptive] High London June 1747	67	1082	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Canary grass [loose] Phalaris...[descriptive] in the green lane going from Graysium Lane turnpike to Highgate, 1749. this year 1751. I pass't over a field of several acres at Childwick near St Albany that had been sown with it and yielded tollerably well.	68	1083	
		Nymphaea... [descriptive] yellow water lily High Kingbury church in Midlesex. 1750	69	1084	
		Juncus... [descriptive] Soft Ruth Nigh London plentifully. 1750	70	1085	
		Trifolium...[descriptive] Strawberry trefoil near Kingsbury Middlesex 1750	71	1086	
		Anthericum...[descriptive] the least Scotish Asphodel Dr. Butner brought me this from Whales. 1751	72	1087	
		Sedum...[descriptive] Stonecrop of St. Vincents Rock. Dr Butner. 1751	73	1088	
		Polygonum... [descriptive] Knot grass	74	1089	
		A specie of spurge [loose] Euphorbia...[descriptive] in the field about Childwick Berry near St Albans Hertfordshire. Sept 1751.	75	1090	
		A specie of toad flax [loose] Antirrhinum Childwick Berry	76	1091	
		Prunella a specie of selfheal [loose] Brunella folio lacimiato Mr Blackstone 1751.	77	1092	
		Lavatera...[descriptive] Tree Mallow	78	1093	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Ruscus... [descriptive] Narrow leav'd Ruscus with the berries on the tops of the stalks.	79	1094	
		Cistus Dwarf or little Sunflower	80	1095	
		Mespilus. Neopolitan Medlar	81	1096	
		Euonymus...[descriptive] the spindle tree in the Hedges about Childwick Berry in Hertfordshire. Sept 1751	82	1097	
		Striped Viburnum	83	1098	
		American sage leaved Viburnum	84	1099	
		Quercus...[descriptive] the oblong or serrated leav'd flex from Roxford the Seat of _____ Brady Esq. near Hertford. Sept 1751. Evergreen oak	85	1100	
		Cedar of Libanus Pinus	86	1101	
			87	1102	
		Sagina a specie of pearlwort	88	1103	
			89	1104	
			90	1105	
			91	1106	
			92	1107	
			93	1108	
			94	1109	
			95	1110	
			96	1111	
			97	1112	
			98	1113	
			99	1114	
			100	1115	
		Strip'd grass	101	1116	
		ordo oda Filices [loose]		1116	
		Equisetum. Horse tail	102	1117	
		Crocus. Saffron	103	1118	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Equisetum... [descriptive] Horse tail	104	1119	
			105	1120	
		Equisetum... [descriptive] Anglice . Horsetail. Naked horsetail	106	1121	
		Equisetum. Great water horsetail	107	1122	
		Osmunda... [descriptive] Osmund royal On a Bogg hill going from montmoreney to St. prit. 6 Leagues from Paris July 1742.	108	1123	
		Polypodium. Rough spleenwort [loose] Pteris... [descriptive] Lonkite rough spleenwort from the great bogg on Hamstead heath. March 1746.		1124	
		Asplenium. Maiden hair Commonly call'd wallrue	109	1125	
		Asplenium. English black maiden hair	110	1126	
		Asplenium... [descriptive] English. Black maiden hair. From the walls of an old bason in the Park of Meud on nigh Paris. June. 1742.	111	1127	
		Asplenium. Harts tongue Hudson 384	112	1128	
		Polypodium... [descriptive] Male fern. With this set deeply indented leaves. From mendon. Nigh Paris. June 1742.	113	1129	
		Polypodium... [descriptive] Common male fern. From Hamsted heath. 1746	114	1130	
		Polypodium... [descriptive] Polypody from Hamstead Heath 1745.	115	1131	
		Polypodium	116	1132	
		Polypodium. Polypody of the oak	117	1133	
		Polypodium. American polypody. [loose] Polypodii cupisdam Americani folium from Mr Gordon's Garden at Mile End	118	1134	American fern??

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Polytrichum	119	1135	moss
		Polytrichum	120	1136	moss
		Polytrichum Small golden maiden hair [loose] Polytrichum... [descriptive] From Poarrham wood. Jan 1746. it grows on Hamstead Heath. ?	121	1137	moss
		Bryum gracile ornithopodioides. H.H. 320 from Hamstead Heath March 1746	122	1138	moss
		Bryum reclinatum, [descriptive]... Mr Hill. May 1746	123	1139	moss
		Bryum. Rough bryum. Hudson 415 [loose] Bryum nitidum... [descriptive] from Chalton wood. By Mr Hill. May 1746.	124	1140	moss
		Bryum. Health bryum. Hudson 408 [loose] Bryum... [descriptive] from woolwich Mr. Hill. May 1746	125	1141	moss
		Bryum, yellow bryum Hudson 416 [loose] Bryum... [descriptive] little goldilocks or Golden Maiden Hair. Nigh Paris June. 1742	126	1142	moss
		Lycopodium. Grey marsh moss Hud. Between Chalton and woolwich. Mr Hill May 1746	127	1143	moss
		Bryum capitulis oblongis... [descriptive] From Hamstead Heath. March 1746	128	1144	moss
		Bryum... [descriptive] from Hamstead Heath. March 1746	129	1145	moss
		Bryum... [descriptive]	130	1146	moss
		Hypnum... [descriptive] broad triangular leav'd Hypnum. From Barrham wood. Jan 1746.	131	1147	moss

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Trailing Hypnum Hudson 423 [loose] Hypnum... [descriptive] from Hanstead Heath. March 1746.	132	1148	moss
		velvet hypnum Hypnum... [descriptive] from Barrham wood. Jan 1746	133	1149	moss
		Hypnum [loose] Hypnum terrestre... [descriptive] from Hampstead Heath	134	1150	moss
		Hypnum proliferous Hypnum repens... [descriptive] from Hampstead Heath. March 1746	135	1151	moss
		Hypnum [loose]	136	1152	moss
			137	1153	moss
			138	1154	moss
			139	1155	moss
			140	1156	moss
			141	1157	moss
			142	1158	moss
			143		moss
		Lycopodium. Common club moss. Hudson 394. [loose]	144	1159	
		Marchantia... [descriptive] Lichen... [descriptive] Lord Petres Thorndon. June 1746.	145	1160	liverwort
		Lichen. Tree liverwort. Or lung-wort. Hud. 449. Johnson, 1566.	146	1161	
		Lichen. Ash colored ground Liver-wort. Hudson 454 [loose] Lichenoides... [descriptive] Ash coloured ground liverwort. From Hampstead Heath. March 1746.	147	1162	
		Lichen. Horn Liverwort. Hud. 452 [loose] Lichenoides... [descriptive] Mr D'Acosta	148	1163	
		Lichen. Ash Liverwort. Hud. 452 [loose] Lichen... [descriptive] from Barrham wood. Jan 1746	149	1164	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV		Lichen. Common Liverowrt, Hudson 447. [loose] Lichen... [descriptive] Mr Dacosta 1746.	150	1165	
		Lichen. A live liver wort. Hudson 446. [loose] Lichenoides... [descriptive] from Barrham wood, Jan 1746.	151	1166	
		Lichen. Horn'd liverwort. Hud. 459 [loose] Lichen... [descriptive] Horned moss. From Hampstead Heath. March 1746.	152	1167	
		Lichen. Mealy liverwort. Hudson. Sp. 39. 451. [loose] Lichenoides... [descriptive] from barrham wood January 1746.	153	1168	
		Lichen. Prickly liverwort. Hudson 459. [loose] Lichenoides... [descriptive] from Hamstead Heath. March 1746.	154	1169	
		Ophiaglossum. A specie of adders tongue.	155	1170	
			156	1171	
			157	1172	
		Lichen	158	1173	
			159	1174	
			160	1175	
		Equisetum. Stinking water horsetail. Johnson 1115. [loose] Chara... [descriptive] In ditches nigh Kentish Town. July 1747.	160		
			161	1176	Seaweed
			163	1177	
			164	1178	
			165	1179	
			166	1180	
			167	1181	
			168	1182	
			169	1183	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
IV			170	1184	
			171	1185	
			172	1186	
			173	1187	
			174	1188	
			175	1189	
			176	1190	
			178	1191	
			179	1192	
			180	1193	
			181	1194	
			182	1195	
			183	1196	
		Equisetum. Wood horse tail. Johnson 1114	184	1197	
		From the Cape of Good hope. Mr Dunn	185	1198	
		From the Cape of Good hope. Mr Dunn	186	1199	
		From the Cape of Good hope. Mr Dunn	187	1200	
		Bought in London by Mr Dunn, from the Cape of Good Hope	188	1201	
		The Cape of Good Hope. Mr Dunn.	189	1202	
		From the Cape of Good Hope. Bought in London by Mr Dunn	190	1203	
		From the Cape of Good Hope. Mr Dunn	191	1204	
		English Mosses. Mr Dunn	192	1205	
		English Mosses. Mr Dunn	193	1206	
		English Mosses. Mr Dunn	194	1207	
		English Mosses. Mr Dunn	195	1208	

Volume V

Vol.	Notes on page	W.C's No.	Pic. ref.	Further information
V	Valentia... [descriptive] Croswort , or mugweed. Four leaved rubi or madder Mr Hill.	1	1210	
		2	1211	
		3	1212	
		4	1213	
		5	1214	
	Galeopsis Narrow leav'd all heal Hudson 225.	6	1215	
	This appears to be a specie of turrils. Towers Mustard. Johnson 272	7	1216	
	Lycopodium. Labine facie	8	1217	
	Stellaria. Linn. Small stitchwort [loose] Alsine fugaei tetrapetalo	9	1218	
	Sweet smelling moss of St winifredes well	10	1219	
	Lichenoides	11	1220	
	Lychnis alpina Campion of the alpes	12	1221	moss
		13	1222	[smudged]
	Saxifraga alpina trifido folio Saxifrage of the alpes	14	1223	
	Lobelia. Water Gladiole. Hud. 329 [loose] Dortmana Rudbeckie. Gladiolus Cacustris	15	1224	
	A specie of Cupressus Cypress	16	1225	
	Senecio aquaticus Water ragwort. Hud. 317 [loose] Jacobaea [descriptive] Broadleav'd Marsh or water Ragwort. High London 1749	17	1226	
	Senecio... [descriptive] Perennial groundsel = leav'd ragwort. High London 1749	18	1227	
	Urtica. Comon Nettle	19	1228	
	Vinca. Periwinkle	20	1229	
		21	1230	
	Linum. Purging flax. Hud. 116. Johnson 560 [loose]	22	1231	
		23	1232	
		24	1233	
	Linum. Narrow leav'd wild flax. Hudson 116.	25	1234	
		26	1235	
		27	1236	
		28	1237	
	this looks like a specie of samphire	29	1238	

Vol.	Notes on page	W.C's No.	Pic. ref.	Further information
V	Spiraea americana. American meadow sweet	30	1239	
	this appears to be a leaf of the Spiraea or Meadow Sweet of america	31	1240	
		32	1241	
	Phytolacca americana. Night shade	33	1242	
		34	1243	
	Lysimachia. Yellow willow herb or Loosestrife. Hudson. 72. Johnson. 474.	35	1244	
		36	1245	
	this appears to be a specie of Brassica, rape or Rhaphanus radish.	37	1246	
	a specie of Sisymbrium. Water rocket.	38	1247	
		39	1248	
	Spirea. A specie of drop-wort	40	1249	
	Like specie of Conyza. Fleabane	41	1250	
	appears to be a specie of Conyza. Fleabane	42	1251	
	a specie of Solidago. golden rod	43	1252	
	Solidago. Virga aurea. Ray Syn. 176 or golden rod Canewood. July 1747.	44	1253	
	Solidago. Golden rod	45	1254	
		46	1255	
	Gnaphalium A specie of everlasting.	47	1256	
	A specie of anthemis. Camomile or ox-eye	48	1257	
	this appears to be a specie of Solidago. Woundwort	49	1258	
	A specie of Veronica. Speedwell.	50	1259	
		24-2	1260	Moss. From later volume?
	Quercus. Evergreen oak	51	1261	
	appears to be a specie of phillyrea. Mock privet.	52	1262	
	Oenothera. Tree primrose	53	1263	
		54	1264	
	this appears to be a specie of Stellaria. Stichwort	55	1265	
	This appears to be a specie of flax. Linum	56	1266	
		57	1267	
	Thalictrum. Lesser meadow rue. Hud. 216	58	1268	
		59	1269	
		60	1270	
	Acinos. Stone Basil. Johnson. 675	61	1271	
	Hyssopus. Hyssop with blue flowers	62	1272	
	Dracocephalum. Dragons head of virginia. Millr	63	1273	
		64	1274	

Vol.	Notes on page	W.C's No.	Pic. ref.	Further information
V	this appears to be a specie of Thymus. Wild Thyme	65	1275	
	has the appearance of a specie of Linum. Flax	66	1276	
	Sisymbrium. Water rocket. Hud. 35. J. Johnson. 248.	67	1277	
		68	1278	
	it appears to be oenanthe. Water dropwort	69	1279	
	Senecio. A specie of ragwort	70	1280	
	Looks like a specie of willow herb	71	1281	
	A specie of papaver. Poppy.	72	1282	
	Valeriana... [descriptive] May 1742	73	1283	
	Primula Cow-slip	74	1284	
	Primula Cow-slip	75	1285	
	Lotus... [descriptive] Square codded pease	76	1286	
			1287	
	Tradescantia... [descriptive] Virginian Spiders webb with a blew flower. From my own garden London. July 1745	78	1288	
	Tradescantia. Virginian spider wort [loose] Ephemerum... [descriptive] Virginian spiderwebb	79	1289	
	Circaea lutetiana... [descriptive] Enchanters nightshade Hamstead heath June 1747.	80	1290	
	Samolus... [descriptive] round leav'd water pimpernel. At Meudon near the pond call'd la Garenne. Idest. Warren. June 1742	81	1291	
	Clematis... [descriptive] Double Virgins Bower	82	1292	
	Potamogeton... [descriptive] Broadleav'd pondweed. High Paris. July 1749	83	1293	
	Pirus. Cab tree. Hudson. 190.	84	1294	
	Mespilus, a specie of thorn	85	1295	
	Tulipa. Tulip	86	1296	
	A specie of Tulipa. Tulip	87	1297	
	Ranunculus... [descriptive] From the Park of March high Paris. April 1743. N.P. Filix Lobata, globulis puherne lentis undique alperta. D. Poobart. Ruij Spc. 2d.8.124. Plate 3 fig. 1. is no more than the leafe of this plant, beset with insect's eggs. A specimen whereof Mr J Hill shew'd me in his Hortus Siccus, Gathered by himselfe.	88	1298	

Vol.	Notes on page	W.C's No.	Pic. ref.	Further information
V	the one with seeds is a specie of Euphorbia. Spurge. The other not known	89	1299	
	Rumex. Sheep's sorrel. Hud. 136	90	1300	
	Lychnis. Wild ragg'd robin	91	1301	
	Rosa. Wild rose	92	1302	
	Rosa. Mass provence rose	93	1303	
	Rosa. Wild rose or dog rose	94	1304	
	Dictamnus. Fraxinella. White Dittany	95	1305	
	Ranunculus. A specie of crowfoot	96	1306	
	Geranium. A specie of cranesbill	97	1307	
	Viola tricolor. Pansies. Hearts ear. Three faces under a hood. Hud. 331.	98	1308	
	Galeopsis. Hedge nettle. Hud. 226	99	1309	
	Pedicularis.... [descriptive] great marsh red rattle or louse wort. From Hamstead Heath the back of the long roome. July 1745.	100	1310	
	Scrophularia. Balm leav'd fig-wort. Hudson 240	101	1311	
	this appears to be a specie of polygala. Milkwort	102	1312	
	Genista. Green wood dyer's weed or woodwaxen. Hudson 272	103	1313	
	Cuckow pint. Wake-robin. [loose] Arum maculatum Maerlis luteis(??)	104	1314	
	Arum. Wake-Robin. Cuckow pint [loose]	105	1315	
	Aphrys. Tway blade	106	1316	
	a specie of orchis	107	1317	
	Centaurea major. Great knapweed	108	1318	
	Spartium. Common broom. Hud. 270	109	1319	
	Ulex. Furze whins. Or Gorse. Hud. 272	110	1320	
	Like a specie of vetch	111	1321	
	A specie of peas	112	1322	
	Looks like a sepecie of Hedysarum. St. Join or cockshead.	113	1323	
	a specie of Heiracium. Hawkweed	114	1324	
	Hieracum. Hawkweed. If not Lapoana. Nipplewort	115	1325	
	Tamus. Black briony. I am not sure if this name is right	116	1326	
	Orchis	117	1327	
	Orchis	118	1328	
	Orchis	119	1329	
	a specie of orchis	120	1330	
	Basteria. All-spice. Millr. Myrtus. Linn.	121	1331	
	Stellaria. Broad leav's stitch wort. Hud. 176	122	1332	
	Cupressus. Cypress deciduous.	123	1333	

Vol.	Notes on page	W.C's No.	Pic. ref.	Further information
V	a specie of arum. Wake robin	124	1334	sample missing from sheet
	Gallium. The least goose grass	125	1335	

Volume VI

Vol.	Notes on page	W.C.'s No.	Pic. Ref.	Further information
VI	Volume front contains two booklets of latin text. Linnaeus - Genera Plantarum. Classis Vigessima. Gynandria Caroli Linnei observations in regnum vegetabile. Also the remains of a bound book of seaweed samples.			
	Quercus. Oak Chestnut Leav'd [loose] New England oak	1	1365	
	Quercus. [loose] Maryland or Iron Oak or white oak	3	1366	
	Crataegus. White beam. Not scarlet oak [loose] Scarlet oak	2	1367	
	Quercus [loose] Strip'd oak	4	1368	
	Quercus. [loose] Chesnut leav'd oak	5	1369	
	Like a specie of Ilex. Dahoon holly. [loose] Willow leav'd Oak	6	1370	
	This appears to be a specie of Carpinus. Hornbeam [loose] Ilex	7	1371	
	Cupressus. Deciduous cypress [loose] American cypress	8	1372	
	Cupressus. [loose] Cypress	9	1373	
	Platanus [loose] West India Plane	10	1374	
	Platanus [loose] Spanish Plane	11	1375	
	Platanus [loose] Oriental Plane	12	1376	
	Platanus [loose] Cut-leav'd plane	13	1377	
	Acer [loose] Ash Lv'd Maple	14	1378	
	Acer [loose] Norway maple	15	1379	
	Acer [loose] Virginia flowering maple	16	1380	
	Acer [loose] Large F Maple	17	1381	
	Crataegus. [loose] Maple leav'd service	18	1382	
	Fraxinus [loose] Virginia flowering ash	19	1383	
	Ash keys in June	20	1384	
	Sorbus [loose] Manna ash	21	1385	
	Sorbus [loose] Mountain Ash or wild Service this bears large Bunches of white flowers	22	1386	
	Tilia [loose] Red Twig'd Lime	23	1387	
	Tilia [loose] Small leav'd lime	24	1388	
	Tilia [loose] Carolina Lime	25	1389	

Vol.	Notes on page	W.C.'s No.	Pic. Ref.	Further information
VI	Salix [loose] White sallow	26	1390	
	Salix [loose] Round leav'd Sallow	27	1391	
	Salix Black Sallow	28	1392	
	Spirea. American meadow sweet. Not ulmaria. [loose] Ulmaria this sort mek's a Large Shrub	29	1393	
	Myrica [loose] Sweet willow	30	1394	
	Ruscus. Butcher's Broom. Not weeping willow. [loose] Weeping willow	31	1395	
	Salix [loose] Willow	32	1396	
	Salix [loose] Yellow Willow	33	1397	
	Carpinus [loose] Horn Beam	34	1398	
		3-2	1399	Probably from another volume
	Philadelphus. Mock orange [loose] Syringo	35	1400	
	Ulmus. Yellow Elm in ??? June Ulmus yellow elm in May	36	1401	
	Ulmus. Dutch Elm	37	1402	
	Ulmus Hertfordshire Elm	38	1403	
	Ulmus. Salisbury Elm Ulmus. Narrow Leav'd Elm	39	1404	Two samples on one page
	Ulmus. Witch Elm	40	1405	
	Acer. Maple. Not Elm [loose] Common Elm	41	1406	
	this has the appearance of a specie of Quercus. Evergreen oak. [loose] Cornish Elm	42	1407	
	Fagus [loose] Beech	43	1408	
	Populus [loose] Aspin	44	1409	
	Betula. Alder tree [loose] Alder	45	1410	
	Sorbus [loose] Manured Service	46	1411	
	Polypodium. Common male fern	47	1412	
	Thuya. Arbor vita or tree of life. Not Lignum vita [loose] Lignum vitae	48	1413	
	Ulmus. Elm Tree not tamarisk [loose] German tamarisk	49	1414	
	not Alaternus. Rhamnus. Evergreen privet [loose] Alaternus or evergreen privet. Virginian viburnum	50	1415	Two samples one sheet
	Liriodendrum [loose] Tulip tree	51	1416	
	Palurus is Rhamnus. Christ's thorn [loose] Pistacia. Turpentine tree. [loose] Pallurus Turpentine tree	52	1417	Two samples on one sheet

Vol.	Notes on page	W.C.'s No.	Pic. Ref.	Further information
VI	Populus [loose] Tacamahaca	53	1418	
	Eleagnus. Wild olive. Or oleaster [loose] Oleaster	54	1419	
	Sambucus [loose] Mountain elder	55	1420	
	Sambucus [loose] White elder	56	1421	
	Sambucus [loose] Strip'd Elder	57	1422	
	Sambucus [loose] Parsly Leav'd Elder	58	1423	
	Populus [loose] Poplar	59	1424	
	Populus [loose] Poplar of Carolina	60	1425	
	Populus. Greenabele or poplar [loose] Green Abel	61	1426	
	Populus. White abele tree [loose] White Abel	62	1427	
	Carpinus [loose] Hop horn beam	63	1428	
	Aesculus [loose] Strip'd horse chesnut	64	1429	
	Juglans [loose] Wallnut	65	1430	
	Juglans [loose] Black virginian Wallnut	66	1431	
	Juglans. All the three [loose] White virginia wallnut Long ditto Shagbag nut	67	1432	
	Fagus [loose] Provence Chesnut	68	1433	
	Juglans Hiccory Nut [loose] Juglans pig nut [loose] Hickory nut Pig nut	69	1434	
	Corylus. Filberd Nutt [loose] Filbert	70	1435	
	Pistacia tree [loose] Pistachia	71	1436	
	Pistacia tree [loose] round leav'd Pistachia	72	1437	
	Rhus [loose] Virginian Sumach	73	1438	
	Rhus [loose] This sort of Sumach rises to be a large tree	74	1439	
	Rhus [loose] New England Sumach	75	1440	
	Gleditsia [loose] Three thorned Acacia	76	1441	
	Robinia. False acacia [loose] 1. Pseudo acacia	77	1442	
	Robinia. False acacia [loose] 2. Pseudo acacia	78	1443	

Vol.	Notes on page	W.C.'s No.	Pic. Ref.	Further information
VI	Celtis. Nettle tree. Not lotus[loose] Lotus	79	1444	
	Mespilus [loose] Large dutch medlar	80	1445	
	Berberis. Berberry [loose] Barberry	81	1446	
	Spartium [loose] Broom	82	1447	
	Spartium [loose] Spanish broom	83	1448	
	Bignonia. Ash leav'd trumpet flower [loose] Bignonia	84	1449	
	Pistacia. Mastick tree. Not azederach [loose] azedarach	85	1450	
	Pinus. Larch tree [loose] Larix	86	1451	
	Bosea. Yerva mara or golden rod tree. [loose] Yerva mora	87	1452	
	Viburnum. Wayfaring tree [loose] Viburnum	88	1453	
	Chionanthus [loose] Shore(?) drop tree	89	1454	
	Rosa [loose] Apple bearing rose	90	1455	
	Morus [loose] White Mulberry	91	1456	
	Morus [loose] this sort bears Mulberries and(?) eas(?) Juli	92	1457	
	Morus. Mulberry Tree [loose] this sort bears catkins and very few mulberries	93	1458	
	Mespilus [loose] common large leav'd Haw	94	1459	
	Mespilus [loose] common small leav'd Haw	95	1460	
	Mespilus [loose] Black berry'd Haw	96	1461	
	Mespilus [loose] Virginian Haw with long thorns	97	1462	
	Mespilus [loose] Cockspur thorn	98	1463	
	Mespilus [loose] Haw with yellow fruit that has but few thorns	99	1464	
	Fragaria [loose] Wood strawberry	100	1465	
	Fragaria [loose] Green Strawberry	101	1466	

Vol.	Notes on page	W.C.'s No.	Pic. Ref.	Further information
VI	Prunus [loose] Cherry Plum	102	1467	
	Prunus [loose] Wild Plum	103	1468	
	Double flowering Plum	104	1469	
	Prunus [loose] Green Gage Wild ditto	105	1470	two samples
	Amygdalus [loose] Peach	106	1471	
	Amygdalus. Peach [loose] Amygdalus. Nectarine [loose] Wild Peach Wild nectarine	107	1472	
	Amygdalus [loose] White flowering almond	108	1473	
	Ficus [loose] White fig	109	1474	
	Punica. Pomegranate [loose] Pomme Granate	110	1475	
	Pyrus [loose] Wild pear	111	1476	
	Pyrus [loose] Double pear	112	1477	
	Pyrus [loose] Twise bearing pear	113	1478	
	Prunus [loose] Apricot Wild ditto	114	1479	two samples
	Prunus[loose] Ht. Cherry	115	1480	
	Prunus [loose] Macaleb or perfum'd cherry	116	1481	
	Prunus [loose] Morello cherry	117	1482	
	Prunus wild cherry Wild black cherry. Prunus	118	1483	two samples
	Cornus mas with a yellow flower	119	1484	
	Cornus femina Virginiana female virginia dogwood	120	1485	
	Benjamin	121	1486	
	Mespilus [loose] Virginia Azarole This produces thorns rather less than the Cockspur	122	1487	
	Mespilus [loose] Azarole with yellow Fruit.	123	1488	

Vol.	Notes on page	W.C.'s No.	Pic. Ref.	Further information
VI	Mespilus [loose] Notingham Medlar	124	1489	
	Phillyrea. Mock privet. Broad strip'd leav'd [loose] Strip'd Philaray	125	1490	
	Syringa. Lilac blue [loose] Blue Lilacs, Lilacs	126	1491	
	Crataegus, wild service am not sure if right [loose] Whitebeam	127	1492	
	Juniperus. Common savin. Savine	128	1493	
	Cucurbita. Water melon. Linn[loose] Sandia or Water melon	129	1494	
	Viburnum. Laurus tinus	130	1495	
	Privet. Ligustrum	131	1496	
	Euonymus. Spindle tree of virginia. Strip'd Strip'd Virginian Euonimus	132	1497	
	Virginia trefoil	133	1498	
	Coronilla Scorpion Sena	134	1499	
	Colutea Bladder Senna	135	1500	

Volume 1

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. Ref.	Any further information
1		**Inside front cover:** **Hortus Siccus** **Ubi** **Planta Distributa Sunt** **Secundum** **Linnai Systema Sexuale** **apud Burton Constable** **In Cava Deira** **Anno** **Ab Incarnatione** **Christi** **1763**		73	
	Class first monandria. One stamen or husband Order first monagynia one style.	Canna Scarlet. Indian Flowering Weed. [top of page] Class first monandria. One stamen or husband Order first monagynia one style.	1-1	74	Sample missing
	Class second diandria or two stamina Order first monogyria. But one style	Jasminum common yellow Class second diandria or two stamina Order first monogyria. But one style	2-1	75	
		Jasminum Trifolium	2-1	76	
		Phillyrea Mock privet	2-1	77	
		Phillyrea Mock privet	2-1	207	
		Phillyrea Mock privet with a Rosemary leaf	2-1	78	
		Phillyrea Mock privet with an olive leaf	2-1	79	
		Olea Olive	2-1	80	
		Ligustrum Common Privet	2-1	81	
		Rosmarinus Common Rosemary	2-1	82	
		Syringa flore Purpureo Vulgo Persian Jessamine	2-1	83	
		Syringa flore albo	2-1	84	
		Syringa with Blue flowers	2-1	85	
		Philadelphus Mock orange	12-1	86	
		Blush Veronica	2-1	87	
		Veronica Brooklime and Becabunga(?)	2-1	88	
		Veronica Chamadrys. Hud. 5P Wild Germander	2-1	89	Hud. 5P
		Veronica Paul's Betony. Hud: 4 Or Male Speedwell	2-1	90	Hud: 4
		Veronica Bellidoide	2-1	91	
		Blitum Strawberry Spinach or Blite	1-2	92	
		Salvia Red Garden Sage	2-1	93	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. Ref.	Any further information
1		Circaea Enchanter's night shade or Circaea lutetiana Hud. 9	2-1	94	Hud. 9. Also labelled 356
	Class third triandria. 3 stamina or husbands Order first monogynia. One style	Valeriana Wild Valerian Valeriana Officinalis Hud. 12	3-1	95	Hud. 12
		[none]	3-1	96	
		Valeriana With a Red flower Hortensis	3-1	97	
		Valeriana Corn Sallad Valeriana locusta Hud. 12	3-1	98	Hud. 12
		White Bulbous Iris	3-1	99	
		Iris bulbous yellow. Iris Linn:	3-1	100	
		Persian Iris flower de luce Iris Linn	3-1	101	
		Iris pseudacorus Hud 13. yelow water flower De Luce	3-1	102	
		Cneorum Widow Weal	3-1	103	
		Schoenus a species of Cyprus Grass	3-1	104	
		Scirpus a species of rush. Hud 17. Gramen junceum folio articulata Reed Grass with articulate leaves		105	Hud 17
		[none]			
		[none]		106	
		Eriophorum Polus tachion Cotton Grass	3-1	107	
		Ira(?) Mat Nardus stricta Mat Grass Hud. 20	3-1	108	Hud. 20
	Order second digynia or two styles Class third	[none]		109	
		[none]		110	
		[none]		111	
		[none]		112	
		[none]		113	
		[none]		114	
		[none]		115	
		[none]		116	
		[none]		117	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. Ref.	Any further information
1		[none]		118	
		[none]		119	
		Grammon pinnatum from Mr Knowlton		120	
		[none]		121	
		Alopecurus Fox tail grass Johnson. 87	3-2	122	Johnson. 87 [notes at the bottom] 123
		Alopecurus pratensis Meadow Fox tail grass Hud. 23	3-2	123	Hud. 23
		Agrostis spica venti Hud. 26. Silky Bent Grass	3-2	124	Hud. 26
		Agrostis capillaris Hud. 27 Fine bent grass	3-2	125	Hud. 27
		Briza media Middle quaking grass Hud. 32	3-2	126	Hud. 32
		Poa pratensis Hud. 33 Great Meadow Grass	3-2	127	Hud. 33
		Festuca fluitans Flote Fescue Grass Hud. 38	3-2	128	Hud. 38
		Fetuca A species of fescue grass	3-2	129	
		Aurna Wild oat	3-2	130	
		Aurna A species of oat grass	3-2	131	
		[none]		132	
		Arundo calamagrostis Hud. 43 Branch'd reed grass	3-2	133	Hud. 43
		Arundo Strip'd reed	3-2	134	
		Darnel Grass Lolium Hud. 44	3-2	135	Hud. 44
		Cynosurus cristatus Crested dog tail grass Hud. 47	3-2	136	Hud. 47
		Saccharum Sugar cane	3-2	137	
	Class fourth tetrandria. 4 staminas or husbands Order first monogynia. One style	Dipsacus. Wild Teasel Hud. 49	4-1	138	Hud. 49
		Scabiosa succisa Devil's bit. Hud. 50 Morsus Diaboli Johnson 726	4-1	139	Hud. 50
		Scabiosa. Indian sweet	4-1	140	
		Scabiosa Shrubby African	4-1	141	
		Plantago Plantain Broadleav'd Plantago major. Hud. 51 Great Plantain or Way bread(?)	4-1	142	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. Ref.	Any further information
1		Plantago; Hoary Plantain Plantago media Hud 51	4-1	143	Hud 51
		Plantago uniflora Hud. 53 Grass leav'd plantain From Cherry Cob land	4-1	144	Hud 53
		Sanguisorba Wild Burnet Hud. 53	4-1	145	Hud 53
		Asperula Wood roof Asperula odorata Hud: 55	4-1	146	
		Galium Ladies Bedstraw with yellow flowers	4-1	147	
		Galium Ladies bedstraw with white flowers	4-1	148	
		Galium Caule Erecto Ladies Be Straw with an upright stalk	4-1	149	
		Galium uliginosum Hud. 56 Marsh Goose Grass	4-1	150	Hud. 56
		Alchemilla Common Ladies mantle	4-1	151	
		Rivinia American night shade tree	4-1	152	
		Epimedium Barren wort	4-1	153	
		Ilex Holly	4..3	154	
		Ilex Holly Dahoon	4-2	155	
	Order the third tetragynia Comprehending Such Plants as have four styles	Potamogeton natans Broad leav'd pondweed Hud. 60	4-3	156	Hud. 60
		Potamogeton Glass leav'd Pond Weed	4-3	157	
		Potamogeton	4-3	158	
		Sagina procumbens. Hud. 63. Pearlwort or Chick weed breakstone. This belongs to the 4th Class 3rd order	4-3	159	Hud. 63
	Pentandria. This Class Consists of such plants as one furnish'd with five stamina or Husbands. Order the first monogynia. Comprehends such plants as have but one style or wife.	Myosotis Mouse ear scorpion grass	5-1	160	Two samples
		Myosotis Scorpion Grass	5-1	161	
		Cynoglossum Hounds tongue	5-1	162	
		Pulmonaria Jerusalem Sage	5-1	163	
		Symphytum Comphry with whitish yellow flowers	5-1	164	
		Borrago Borage Common	5-1	165	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. Ref.	Any further information
1		Borrago Borage never Dying	5-1	166	
		Echium Viper's Bugloss	5-1	167	
		Primula Vulgaris Hud. Fil Brit (?) 70 Primrose	5-1	168	Hud. 70?
		Primula common Yellow Cowslip	5-1	169	
		Primula Polyanthus	5-1	170	
		Primula auricula	5-1	171	
		Primula auricula	5-1	172	
		Mirabilis Long tub'd Marvel of Peru	5-1	173	
		Menyanthes Trifolia Marsh Trefoil	5-1	174	
		Hottonia palustris Hud. 72	5-1	175	Hud. 72
		Lysimachia flow Luteo yellow Willow herb. Hud: 72	5-1	176	Hud: 72
		Lysimachia Willow herb	5-1	177	
		Anagallis Flore Luteo Johnson Lysimachia Linn	5-1	178	
		Convolvulus minor	5-1	179	
		Polemonium Greek Valerian with a creeping root	5-1	180	
		Polemonium Greek Valerian Blue	5-1	181	
		Polemonium Greek Valerian Strip'd Leav'd	5-1	182	
		Polemonium Greek Valerian with white flowers	5-1	183	
		Verbascum mullein	5-1	184	
		Vinca Periwinkle with white flowers and strip'd leaves	5-1	185	
		Vinca purpurea Purple Periwinkle	5-1	186	
		Vinca Shrubby Periwinkle of Madagascar	5-1	187	
		Hyoscyamus Creticus Luteus Major Henbane	5-1	188	
		Solanum Night shade with a woolly leaf and red fruit	5-1	189	
		Solanum Dulcamara Hud. 78 Woody night shade or Bitter Sweet	5-1	190	Hud.78
		Nicotiana Virginian Tobacco	5-1	191	
		Nerium Oleander	5-1	192	
		Cyclamen Sow bread	5-1	193	
		Physalis Winter Cherry with two leaves at a stalk	5-1	194	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. Ref.	Any further information
1		Campanula Canterbury Bell Flower	5-1	195	
		Trachelium Throat Wort	5-1	196	
		Rhamnus Buckthorn Evergreen	5-1	197	
		Cestrum Bastard Jasmine	5-1	198	
		Lycium Box Thorn	5-1	199	
		Euonymus Virginian Spindle Tree	5-1	200	
		[none]		201	loose sheet
		[none]		202	loose sheet
		[none]	12-5	203	loose in back
		[none]	12-5	204	Loose in back, possibly raspberry?
		[none]	12-5	205	loose in back
		Tamarise gallica. Linn. Spee. Pl. 386. French tamarisk	5-3	206	loose in back

Volume 2

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
2		Hedera helix. Hud. 35 Ivy tree	5-1	208	Hud. 35
		Dodecatheon Linn. Meadia (?) Bear's Ear of Virginia Mill(?)	5-1	209	
		Phlox a species of Bastard Lychnis	5-1	210	
		Phlox a species of Bastard Lychnis with a purple flower	5-1	211	
		Plumbago americana Leadwort	5-1	212	
		Phylica. Bastard alaternus (?) with linear leaves growing in whorls	5-1	213	
		Celastrus Staff tree. Linn.	5-1	214	
		Rapunculus Rampion from Mr Knowlton By the above name. Not sure if it is right.	5-1	215	
		Glaux maritima. Hud. 82. Sea Milkwort or Black Saltwort	5-1	216	
		Lonicera Upright Honeysuckle		217	
		Lonicera Upright Honeysuckle Or dwarf cherry with twin fruit	5-1	218	
		Celosia Cockscomb	5-1	219	
		Azalea	5-1	220	
		Gentiana Gentian or Fellwort	5-2	221	
	Order second Digynia Class with pentandria consists of such plants as are furnish'd with five staminas or husbands Order 2nd digynia contains such plants as have two styles or wives.			222	
		Chenopodium English Mercury or all good.	5-2	223	
		Ulmus Elm tree. Common English	5-2	224	
		Periploca Virginian silk	5-2	225	
		Eryngium Blue sea holly	5-2	226	
		Eryngium White sea holly	5-2	227	
		Hydrocotyle vulgaris Hud. 96	5-2	228	Hud. 96
		Panicula (?) Panicle or self heal	5-2	229	
		Bupleurum Shrubby Hare's Ear	5-2	230	
		Daucus carota Hud. 99 Wild carrot or Bird's nest	5-2	231	
		Conium Hemlock	5-2	232	
		Conium Hemlock	5-2	233	
		Conium Africanum afr. Hemlock	5-2	234	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
2		Imperatoria Masterwort Johnson Imperatoria major Millr. Ligusticum scoticum Scottish Sea Parsley. Ray's synop. Ligusticum scoticum Hud. 102	5-2	235	
		Angelica Common Wild Sylvestris Hud.	5-2	236	
		Angelica Wild strip'd	5-2	237	
		Bunicum Bulbocas tanum Hud. Fil. Br (?) Bunicum common earth nut	5-2	238	
		Charophyllum Chervil	5-2	239	
		Carum Caraway 5-2	5-2	240	
		Apocynum. Dog's Bane Asclepias. Linn.	5-2	241	
		Astrantia Masterwort Black	5-2	242	
		Gomphrena Globe Amaranth	5-2	243	
	Order third trigynia Class fifth pentandria as before. Order 3. Trigynia consists of such plants as have 3 styles			244	
		Viburnum Water elder found on George Caby's moor	5-3	245	
		Viburnum Gelder Rose or Snow Ball Tree	5-3	246	
		Laurustinus Strip'd Viburnum	5-3	247	
		Viburnum. Linn. Laurustinus most common	5-3	248	
		Viburnum. Linn. Laurustuinus Shining Broad Leav'd	5-3	249	
		Rhus. Sumach	5-3	250	
		Staphylaea. Bladder nut three Leav'd	5-3	251	
		Staphylaea. Five leav'd Bladder nut	5-3	252	
		Alsine media Common Chickweed Hud. 113 (143)		253	Hud 113
		Alsine A species of Chickeweed	5-3	254	
		Turnera Shrubby with an elm leaf	5-3	255	
	Order fourth tetragynia Class fifth pentandria as before. Order 4 tetragynia comprehending such plants as have 4 styles			256	
		Parnassia Palustris. Hud. 114 Grass of Parnassus	5-4	257	Hud. 114
	Order fifth pentagynia. Class fifth pentandria as before. Pentagynia, such plants as have five styles			258	
		Statice armeria Hud. 114 Sea Gilly Flower	5-5	259	
		Statice Sea Pink Shrubby	5-5	260	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
2		Limonium Common Great Sea Lavender Statice Limonium. Sea Lavender. Hud. 114	5-5	261	Hud. 114
		Linum Catharticum Hud: 116 Purging Flax	5-5	262	Hud. 116
		Drosera? Rotundo folio Hud 117		263	Hud. 117
	Class sixth hexandria. Plants having six stamina Order first monogynia or such plants as have only one style.			264	
		Common barberry	6-1	265	
		Allium Broad leav'd Aild Garlick or Ramsons	6-1	266	
		Allium flavum	6-1	267	
		Hyacinthus English Hyacinth or Hare Bells	6-1	268	
		Hyacinthus Linn. Muscari. Feathered Hyacinth	6-1	269	
		Asparagus Common Garden	6-1	270	
		Tradescantia Virginian Spiderwort	6-1	271	
		Anthericum Shrubby	6-1	272	
		Aloe. Triangular Leav'd	6-1	273	
		Narcissus Daffodil	6-1	274	
		Hemerocallis Day Lily	6-1	275	
		Tulipa	6-1	276	
		Tulipa	6-1	277	
		Crinum Asphodel Lilly	6-1	278	
		Convallaria One Blade or two Blade	6-1	279	
		Convallaria multiflora. Solomon's Seal Hud. 126	6-1	280	Hud. 126
		Juncus inflexus Hud. 130 Hard Rush	6-1	281	Hud. 130
		Juncus Effusus Hud. 129 Common Soft Rush		282	Hud. 129
	Order third trigynia Class sixth Hexandria. Six stamina. Order third trigynia or Three Styles			283	
		Rumex Sheep's Sorrel	6-3	284	
		Rumex Linn. French Sorrell	6-3	285	
		Acetosa. Shrubby Sorrell african Rumex. Linn.	6-3	286	
	Order fifth polygynia Class sixth hexandria or six staminas Order fifth polygynia. Comprehending such plants as have many styles. Of this there is but one Genus			287	
		Small water plantain Alisma Hud: 137	6-5	288	Hud 137

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
2	Class seventh heptandria Order first monogynia Class 7th Heptandria or Plants having seven stamina or Husbands Order first Monogynia or Plants having but one style.			289	
		Asculus Horse Chesnut	7-1	290	
		Asculus folus variegatis Horse Chesnut with variegated leaves	7-1	291	
	Class Eight Octandria Order first Monogynia Class Eight Octandria or Plants havin 8 stamina. Order first monogynia or having one Style.			292	
		Epilobium French Willow herb	8-1	293	
		Epilobium French Willow Herb with Entire spear shap'd Leaves.	8-1	294	
		Epilobium a Species of Willow Herb	8-1	295	
		Epilobium Loosestrife	8-1	296	
		Epilobium a species of Loosestrife Hud:	8-1	297	Hud:
		Lysimachia Loosestrife Epilobium Hud:	8-1	298	Hud:
		Epilobium Hud. 141 Lysimachia Loosestrife	8-1	299	Hud. 141
		A species of Epilobium or Rose Willow Herb	8-1	300	
		Anothera Tree primrose with plain oval spear shap'd leaves	8-1	301	
		Tropaeolum Double Indian Cress	8-1	302	
	Order third trigynia Class eight Octandria or plants having eight staminas Order 3rd trigynia or having three styles.			303	
		Bistorta. Great Bistort. Polygonium Hud: 147	8-3	304	Hud 147
		Polygonum Bistorta. Hud. 146 Small Bistort or Snakeweed.	8-3	305	
		Polygonum auriculare common Knot Grass	8-3	306	
	Order fourth tetragynia Class Eight octandria, or Plants of eight stamina. Order the fourth Tetragynia or Plants having four Styles.			307	
		Herb Paris, true love or one Berry. Paris Quadrifolia. Hud. 150	8-4	308	
	Class ninth Enneandria, or Plants having 9 staminas Order monogynia, having one style			309	
		Laurus. Narrow Leav'd Bay	9-1	310	
	Order Second trigynia, having three styles. Class ninth Ennandria, 9 staminas			311	
		Rheum English Rhubarb	9-3	312	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
2	Class tenth Decandria, plants having ten stamina. Order first Monogynia, or Plants having but one Style			313	
		Ledum Marsh Cistus Andromeda. Linn.	10-1	314	
		Haematoxylon Hamatoxylum Logwood Tree	10-1	315	
		Clethra Long Spik'd	10-1	316	
		Clethra Short Spik'd	10-1	317	
		Ruta Ruta Rue	10-1	318	
		Cassia Wild Senna	10-1	319	
		Melia Bead tree	10-1	320	
		Sophora occidentalis	10-1	321	
	Order Second Digynia, or two styles Class tenth Decandria, or 10 stamina			322	
		Saxifraga with Indented Kidney Shap'd Leaves.	10-2	323	
		Saxifraga none so pretty	10-2	324	
		Saxifraga with Kidney Shap'd Indented Leaves on the footstalks	10-2	325	
		Saxifraga Granulata Saxifrage with Roots like Grains of Corn Hud: 159	10-2	326	Hud 159
		Saponaria Common Soapwort. Hud. 160	10-2	327	Hud. 160
		Dianthus Sweet William	10-2	328	
	Order third trigynia or three styles Class tenth Decandria, or ten stamina			329	
		Silene Catch Fly Double	10-3	330	

Volume 3

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
3		- Justicia Ecbotium, Malabar nut. Lin. 20 - Cneoreum tricoccum. Lin. Spec. Plan. 49. Widow-wail - A species of Solidago. Golden rod			Three loose notes
		Gramen Leucanthemum. Johnson 47 1?o Stellaria. Greater Stichwort and 166	10-3	331	Johnson 47
		A species of Chick Weed Arenaria Hud. 167	10-3	332	Hud 167
	Class tenth Decnadria Order fourth pentagynia			333	
		Sedum Humile? Sedum Humile?	10-4	334	
		Sedum folus Serrate may 28-63	10-4	335	
		Sedum. Houseleek Alpine or Live-Long 282 Sedum Telephium. Hud 170	10-4	336	
		Sedum. Stone. Crofs?. Commonly call'd brick madam 280	10-4	337	
		Cotyledon. Navelwort with cut leaves and yellow flowers	10-4	338	
		Lychnis flore Coccinea	10-4	339	
		Wild Lychnis red 43 Lychnis Hud. 174	10-4	340	Hud. 174
		Lychnis Hud. 174. Wild Hairy Lychnis with white flowers. 42	10-4	341	Hud. 174
		Lychnis red rag'd robin or Meadow pink. Hud. 174. 181	10-4	342	Hud. 174
		Lychnis campion with white flowers. Commonly call'd reg'd robin. 180	10-4	343	
		Agrostemma rose Campion. [second note] Pseudomelanthium. Bastard Nigella or Cockle. 354/Agrostemma. Linn.	10-4	344	
		[none]		345	
		[none]		346	
	Class Eleventh Dodecandria Order first monogynia			347	
		Lythrum. Willowherb or blue Loosestrife. 186	11-1	348	
		Samyde May 11th - 63	11-1	349	
	Order second digynia Class Eleventh Dodecandria			350	
		Agrimonia. Common agrimony. 28	11-2	351	
	Order third trigynia Class eleventh Dodecandria			352	
		June? Reseca? upright	11-3	353	
		June? Reseda? Sweet Mignonette	11-3	354	
		Daphne. A specie of spurge. 83. Euphorbia. Hud. 184	11-3	355	Hud. 184

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
3		Euphorbia Exigua. Hud. 182. Dwarf spurge	11-3	356	
		Euphorbia, spurge with a red shrubby stalk and St Johns wort leaf. A green houplant	11-3	357	Inside plant?
	Order fifth polygynia Class Eleventh Dodecandria			358	
		May 12 - 63. Houseleek tree Sempervivum. Linn	11-5	359	
	Class twelth Icandria Order first monogynia			360	
		Cerasus Cherry tree with Double flowers. Prunus Linn.	12-1	361	
		Padus. Portugal laurel. Prunus. Linn.	12-1	362	
		Padus wild bird cherry. Prunus Hud. 18?7	12-1	363	Hud 18?7
		Cereus. Lesser? Climbing torch thistle with many spinous angles and purple flowers Millr. Cactus Linn.	12-1	364	
		Persica. Dwarf almond wth single flowers. Amygdalus Linn.	12-1	365	
		Persica almond Dwarf Double flowering. Amygdalus. Linn.	12-1	366	
	Order second Digynia Class twelth Icosandria			367	
		Crataegus aria. Hud. 187. The white-Beam Tree	12-2	368	Hud. 187
		Cratagus Torminalis Common wild service or sorb Hud 188	12-2	369	Hud.188
		Cratagus oxyacantha Hudd 188	12-2	370	
	Order fourth pentagynia Class twelth Icosandria			371	
		Pyrus Malus. Crab tree. Hud. 189	12-4	372	Hud 189
		Mespilus. Thorn pear Leav'd. June?	12-4	373	
		June Mespilus Neapolitan	12-4	374	
		June. Thorn Gooseberry Leav'd Mespilus	12-4	375	
		Mespilus	12-4	376	
		Mespilus. Dwarf american	12-4	377	
		Medlar of Mount Ida Mespilus	12-4	378	
		Spiraea vulgaris Hud. 191. Spiraea Queen of the Meadow.297	12-4	379	Hud. 191
		Spiraea with strip'd Leaves. Meadow sweet. 298. Hud. 191	12-4	380	Hud. 191
		Spiraea. Great American Meadow Sweet. 300 [or800]	12-4	381	
		Spiraea frutex?	12-4	382	
		Spiraea virginia gelder rose	12-4	383	

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3		Spiraea. Commonly call'd Hypericum frutex	12-4	384	
		Fig Marigold with a large purple flower. Mesembryanthemum	12-4	385	
		Mesembryanthemum flore coccinia	12-4	386	
		Mesembryanthemum flore luteo	12-1	387	
	Order fifth polygynia Class twelth Icasandria			388	
		Rosa sylvestris	12-5	389	
		Rosa . Cinnamon rose	12-5	390	
		Hautboy Strawberry Fragaria Linn.	12-5	391	
		Potentilla. Common cinquefoil. 245. Potentilla reptans. Hud. 197.	12-5	392	
		Potentilla. Common cinquefoil. 245.	12-5	393	
		Potentilla album minus. 243	12-5	394	
		Potentilla. Cinquefoil with an upright stalk. 244	12-5	395	
		Potentilla. Silver weed or wild tansy. 242	12-5	396	
		Potentilla . Caule fruticoso	12-5	397	
		Geum rivale. Hud Water herb bennet or avens	12-5	398	
		Geum urbanum. Hud. 198. Common avens	12-5	399	
	Class thirteenth polyandria. Order first monogynia			400	
		Actae. Herb Christopher. 18 Actaea spicata. Hud 201. Baneberries	13-1	401	Hud. 201
		Chelidonium. Common celandine. 58. Chelidonium majus. Hud. 201	13-1	402	
		Chelidonium. Celandine. 57	13-1	403	
		Papaver vulgaris	13-1	404	
		Papaver yellow welsh perennial poppy. 226	13-1	405	
		June. Dwarf Dutch poppy	13-1	406	
		Podophyllum. Ducksfoot or May Apple. 232	13-1	407	
		Cistus folus oblonga. Flore rubro	13-1	408	
		Cistus. Rock rose with the largest flower	13-1	409	
		Cistus. Linn. Helianthemum. Dwarf cistus or sun flower	13-1	410	
		Acacia wth white flowers. Lond broad pods. Mimosa. Linn.	13-1	411	
		Mimosa. Slothfull Sensitive Plant	13-1	412	
		Nymphaea alba. White waterlily. June. Hud. 206	13-1	413	Hud 206
	Order second digynia. Class thirteenth polyandria			414	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
3		Paonia flore rubra pleno	13-2	415	
	Order third trigynia Class thirteenth polyandria			416	
		Delphinium. Commonly called Bee larkspur. 81	13-3	417	
		Delphinium. Larkspur	13-3	418	
		Delphinium. Larkspur	13-3	419	
		[none]	13-3	420	
		Aconitum. Wolfsbane yellow. 7.	13-3	421	
		Aconitum. Monkshood blue	13-3	422	
	Order fifth pentagynia Class thirteenth polyandria			423	
		Nigella. Fennel flower. 208	13-5	424	
		Aquilegia. Columbine. Sterile?	13-5	425	
		Aquilegia flore pleno. Double Columbine	13-5	426	
		Rose columbine. Aquilegia rosea	13-5	427	
	Order seventh polygynia Class thirteenth polyandria			428	
		Anemone. Wild or wood anemone. 35 Anemone nemorosa. Hud.208	13-7	429	
		Pulsatilla. Pasque flower. Anemone pulsatilla. Hud. 209	13-7	430	
		Anemone. The Virginian. 36	13-7	431	
		Anemone. June?	13-7	432	
		Ranunculus Lingua. Hud. 210. Great Spearwort	13-7	433	
		[none]	13-7	434	
		Ranunculus flammula. Hud. 210. Small spear wort.	13-7	435	
		Ranunculus flammula. Lesser Saw'd Leav'd Spear wort(?) Hud 210	13-7	436	Hud 210
		[missing]owfoot single creeping. 254	13-7	437	
		ranunculus upright with a single flower	13-7	438	
		Ranunculus double yellow flower	13-7	439	
		Ranunculus. Fair maid of France. 256	13-7	440	
		Ranunculus arvensis. Hud. 212. Corn Crowfoot	13-7	441	Hud. 212
		Ranunculus Erecto Caule. Flore pleno. 251	13-7	442	
		Ranunculus. Crowfoot, persian	13-7	443	
		Ranunculus aquatilis. Various leav'd water crowfoot. Hud. 213. Johnson 829.	13-7	444	Hud. 213
		Ficaria verna Hud. 214	13-7	445	Hud 214
		Ranunculus globosus. Or Locker gowlons(?). Trollius Hud. 214. 255	13-7	446	Hud. 214

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
3		Caltha palustris Hud. 214	13-7	447	Hud. 214
		Caltha. Marsh marigold with a double flower. 62	13-7	448	
		Helleborus. Stinking black Hellebore. Hud. 215	13-7	449	Hud. 215
		Thalictrum. Feather'd Columbine 473		450	(poss goes with one of earlier unlabelled samples)
		Meadowrue. Thalictrum. 311	13-7	451	
		Magnolia. Broadest leav'd Laurel Leaf Tulip tree	13-7	452	
		Virgins bower. Clematis	13-7	453	
		Clematis ? Folius	13-7	454	
		Clematis upright white 72	13-7	455	
	Class fourteenth Didynamia Order first gymnospermia			456	
		Teucrium germander. 309. Common garden	14-1	457	
		Teucrium. Spanish tree germander	14-1	458	
		June. Phlomis major	14-1	459	
		Phlomis latifolia	14-1	460	
		Bugula. Bugle. Common with blue flowers. Ajuga reptans. Hud. 219. 50	14-1	461	Hud. 219
		Dracoce phalum. Dragon's head of virginia	14-1	462	
		Mentha folius variegatis. 198	14-1	463	
		Curled mint 199	14-1	464	
		Ocymum. Basil narrow leav'd	14-1	465	
		Ocymum latifolium	14-1	466	
		Glechoma. Ground ivy strip'd	14-1	467	
		Glechoma. Ground ivy Common. 121	14-1	468	
		Lamium. Dead nettle with white flowers. 163	14-1	469	
		Lamium. Nettle with heart shaped leaves. 162	14-1	470	
		Lamium archangel red	14-1	471	
		Melissa. Baum with foot stalks divided by pairs. 194	14-1	472	
		Lamium Dead nettle 165	14-1	473	
		Galeopsis. Stinkin hedge nettle. Stachys sylvatica. Hud. 227. 109	14-1	474	Hud. 227

Volume 4

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
4		Lavatera with the appearance of marshmallow	16-3	477	
	Order second angiospermia Class fourteenth Didynamia			478	
		Halleria. Afr. Fly Honeysuckle	14-2	479	
		Citharexylum. Fiddle woad	14-2	480	
		Lantana. American viburnum	14-2	481	
		Viburnum luteo flore. Lantana Linn. May 19 - 63	14-2	482	
		Viburnum urtica folia. Lantana Linn. May 19 - 63	14-2	483	
		Selago or Camphorata	14-2	484	
		Isatis. Woad wild narrow leav'd. 161. Isatis tinctoria. Woad. Hud. 261	17-3	485	Hud. 261
		Pedicularis flore rubra. May 19 - 63	17 - 3	486	
		Pedicularis Louse wort. June	14-2	487	
		Linaria. A species of toad flax. Antirrhinun. Linn.	14-2	488	
		Linaria. Toad flax with a purple flower. Antirrhinum. Linn. 173	14-2	489	
		Antirrhinum. Snap Dragon	14-2	490	
		[none]	14-2	491	
		Linaria Caule erecto Antirrhinum. Linn. 171	14-2	492	
		Linaria trailing parish toad flax. Antirrhinum Linn.	14-2	493	
		Mimulus	14-2	494	
		Digitalis. Fox glove. Common purple. 85	14-2	495	
	Class fifteenth tetradynamia Order first siliculasa			496	
		A specie of mustard or gold of pleasure. Myagrum sativum. Hud. 247	15-1	497	Hud. 247
		Alynum. Mad wort strip'd. 34	15-1	498	
		Cachlearia. Scurvy grass common. Hud 247. 75	15-1	499	Hud. 247
		Candytuft shrubby. Iberis	15-1	500	
		Iberis. Candy tuft purple	15-1	501	
		Iberis. Candy tuft white	15-1	502	
		Lunaria. Satin flower	15-1	503	
		[none]	15-1	504	
	Order second siliquosa Class fifteenth Tetradynamia			505	
		June. Cheiranthus. Annual stock. Heperis Linn.	15-2	506	
		Cheiranthus flore alba	15-2	507	
		[none]	15-2	508	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
4		Cheiranthus. Purple stock	15-2	509	
		[none]	15-2	510	
		Cheiranthus double wall flower	15-2	511	
		Erysimum alliania. Hud. 251. Jack-by-the-hedge.	15-2	512	Hud. 251
		Hesperis. Rocket purple	15-2	513	
		Erysimum. Common hedge mustard. 95	15-2	514	
		Brassica. A specie of Cale. 71	15-2	515	
		[none]	15-2	516	
		Cardamine armara. Butter cress. Hud. 256	15-2	517	
		Cardamine pratensis	15-2	518	
		[none]	15-2	519	
		[none]	15-2	520	
		Sisymbium. Common water cress. Hud. 257	15-2	521	Hud. 257
		Sisymbium. Mustard or water rocket. Hud. 258. 291	15-2	522	Hud. 258
		June. Sinapsis. Wild mustard	15-2	523	
		Hibiscus	16-3	524	
	Class sixteenth monadelphia Order first pentandria			525	
		Hermannia with a broad blunt lavender leaf	16-1	526	
		Hermannia with an oblong serrated leaf	16-1	527	
	Order second decandria Class sixteenth monadelphia			528	
		Geranium. Cranesbill with large blue flowers. Geranium pratense. Hud. 264. 114.	16-2	529	Hud. 264
		Geranium. A sepcie of cranesbill.	16-2	530	
		Geranium. Cranesbill with two flowers upon each foot stalk.	16-2	531	
		Cranesbill with a strip'd flower. Geranium. 117	16-2	532	
		Geranium mezarrhezum. Cranes bill	16-2	533	
		Geranium. Crane's Bill.	16-2	534	
		Geranium. Herb robert	16-2	535	
		Origanum. Wild marjoram. 216. Hud. 229	14-1	536	Hud. 229
		Geranium. Afr. Shrubby Cranes Bill. Smelling Like baum.	16-2	537	
	Order third polyandria Class sixteenth monadelphia			538	
		~~Have not found the name of this plant.~~ Anthyllis. Shrubby	17-3	539	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
4	Order second octandria Class seventeenth Diadelphia			540	[possible some of these have been mixed up. Orders/class not consistent with labels]
		Malva. Mallow. Common Wild. 188	16-3	541	
		[none]	16-3	542	
		Mallow in the gr. House. Malva. Shrubby afr.	16-3	543	
	Class seveteenth diadelphia Order first hexandria			544	
		June. Furnaria vulgaris	17-1	545	
		Furnaria furnatory with a yellow flower.	17-1	546	
		Polygala. Milkwort common. 437	17-2	547	
	Order third decandria Class seventeenth diadelphia			548	
		Genista. Needle furze. Anglica. Hud. 272	17-3	549	Hud 272
		Glycine. Vetch three leav'd	17-3	550	
		Arobus Linn. Galega Shrubby afr. Goats rue	17-3	551	
		Hedysarum. French honeysuckle red.	17-3	552	
		Onobrychis. Cockshead. Hedysarum. Hud. 281. 211	17-3	553	Hud. 281
		Astragalus perennial. 38	17-3	554	
		Goats thorn. Astragalus	17-3	555	
		Trifolium. Melilot trefoil.	17-3	556	
		Trifolium agrarium. Hud. 286. Hop trefoil	17-3	557	
		Trifolium pratense. Hud. 28?4	17-3	558	
		[notes on the publishing of a book, a dictionary? Incomplete book/magazine page]		559	
		Trifolium. Hares foot trefoil. 360	17-3	560	
		Lotus corniculata. Bird's foot trefoil. Hud. 288. Trifolium small cadded trefoil. Johnson 1190	17-3	561	Hudd 288
		Lotus. Wing'd pea	17-3	562	
		Colutea orientalis	17-3	563	
		Colutea. Bladder sena. Ethiopian	17-3	564	
		Coronilla Linn. Emerus. Scorpion Sena. Millr.	17-3	565	
		Glalega common	17-3	566	
		Cystus. Siberian	17-3	567	
		Cytisus	17-3	568	
		Cytisus with erect branches of flowers	17-3	569	
		[none]	17-3	570	
		Cytisus. Pigeon pea	17-3	571	

Vol.	Classification notes	Notes on page	W.C.'s No.	Pic. ref.	Further information
4		Spartium	17-3	572	
		Glycyrrhiza. Liquorice	17-3	573	
		Erythrina. Coral tree. Thick rooted of Carolina	17-3	574	
		Erythrina. Coral tree of america	17-3	575	
		Lupinus. Lupines	17-3	576	
	Class eighteenth polyadelphia Order first pentandria			577	
		[none]	18-1	578	
		Hypericum. Dwarf shrubby St John's wort	18-3	579	
		Hypericum with the largest flower	18-3	580	
		Hypericum. St Johns wort shrubby	18-3	581	
		Hypericum. St Johns wort with square herbaceous stalks. 156. Hypericum Quadrangulum. Hud. 292	18-3	582	Hud. 292
		[none]	18-3	583	
	Class nineeenth syngenesia Order first polygamia. Aequalis.			584	
		Santolina. Lavender cotton. 266	19-1	585	
		Hieracium. A species of hawkweed	19-1	586	
		Hieracium.	19-1	587	
		Pylosella repens. Creeping mouse ear. Johnson 638. Hieracium pilosella. Common creepin mouse ear. Hud. 298.	19-1	588	
		Hieracium minus. Or yellow Divels bit and small hawk weed. 149	19-1	589	
		[none]	19-1	590	

Volume 5

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
5		Obeliscotheca annua flore majore From Lord Petres Garden. Thorndon. June. 1746	19	702	Loose? Seems from old series.
		Scorzonera. Vipers grass 386	19-1	703	
		402 Dandelion. Leontodon Hud. 297	19-1	704	Hud. 297
		Carduuna specie of thistle	19-1	705	
		Eupatorium . Hemp agrimony 96 not sure if this is right	19-1	706	
	Order second polygamia superflua Class nineteenth Syngenesia			707	
		Tanacetum. Tansy Smann shrubby cut Leav'd afr.	19-2	708	
		Absinthium. Worm wood Common 1 Artemisia Linn.	19-2	709	
		Absinthium. Sea worm wood 2 Artemisia Linn.	19-2	710	
		Absinthium. Mountain wormwood 3 Artemisia Linn.	19-2	711	
		Absinthium roman wormwood 4 Artemisia Linn	19-2	712	
		Abrotanum. Southernwood Common garden. 394 Artemisia Linn.	19-2	713	
		Artemisia. Common mugwort	19-2	714	
		Goldyocks wth a white flower. Gnaphalium Hud. 312 125	19-2	715	Hud. 312
		Easbien goldylock Gnaphalium Linn.	19-2	716	
		Chryscoma. Goldylocks most stinking. 128. Gnaphalium Linn.	19-2	717	
		Gnaphalium Linn.	19-2	718	
		Gnaphalium. Goldylocks with a compact corumbus of flowers. 127	19-2	719	
		Petasites. Butter-burr 231 Tussilago Linn.	19-2	720	
		Tunilago farfara Common Coltsfoot Hud. 315 May 11 - 63	19-2	721	Hud. 315
		Senecio purple leaf	19-2	722	
		Senecio eastern ragwort	19-2	723	
		Senecio. Ragwort with a round leaf	19-2	724	
		Senecio a specie of ragwort	19-2	725	
		Senecio. Specie of ragwort. 287	19-2	726	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
5		Solidago. Woundwort. 295	19-2	727	
		Conyza. Fea bane. Johnson 482 481/ Inula Dysenterica. Hud. 320. Middle fleabane	19-2	728	Hud. 320 Johnson 482
		Aster Italian 23	19-2	729	
				730	
		Starwort	19-2	731	
		Aster starwort yellow willow leav'd 22	19-2	732	
		Aster with a toad flax leaf	19-2	733	
		Aster china purple	19-2	734	
		Aster the China white	19-2	735	
		Aster afr. Frutescens Shrubby afr. Star flower	19-2	736	
		Aster. Starwort shrubby in the greenhouse with oval leaves	19-2	737	
		Aster 24	19-2	738	
		Aster	19-2	739	
		Chrysanthemum. Corn Marigold of Crete. Wth Double yellow flowers	19-2	740	
		Chrysanthemum flore pleno Corn Marigold of Crete with Double flowers	19-2	741	
		Anthemis. Ox-eye	19-4	742	
		Achillea millefolium. Hud. 324 Common yarrow or milfoil	19-2	743	Unsure whether picture relates to note - separated
		Matricaria. Common feverfew. 190	19-2	744	Unsure whether picture relates to note - separated
		Centaurea sweet sultan	19-2	745	Unsure whether picture relates to note - separated
		Achilea ptarmica	19-2	746	Unsure whether picture relates to note - separated
				747	Unsure whether picture relates to note - separated
		Tagetes french marigold	19-2	748	
		Tagetes african marigold		749	
		Doronicum Leopards Bane 88	19-2	750	
		Buphtalinum. Ox-eye	19-2	751	
		Bellis flore. Rubra May 11 - 63	19-2	752	
	Order third polygamia frustanea Class nineteenth Syngenesia			753	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
5		Centaurea cyanus. Blue bottles. Hud 32?5? Centaurea common Corn bottle	19-3	754	
	Order fourth polygamia Class nineteenth syngenesia			755	Out of order?
		Othonna or Woundwort in the greenhouse	19-4	756	Out of order?
		in the catalogue of wild plants no 37?8? This is titled senecio. It is othonna sea ragwort with wooly leaves and sinuated ?ags	19-3	757	Unsure whether picture relates to note - separated
		No label		758	
		Helianthus. Sun flower perennial		759 and 760	
		Centaurea lacea. Hud. 326 Common Knap weed or matfellon	19-3	761	Hud. 326
		Centaurea knapweed. 363 Black matfellon	19-3	762	
	Order fifth Monagamia Class nineteenth syngenesia			763	
		Filago. Cotton Weed 98	19-4	764	Out of order
		Viola Violet hearts ease 327	19-5	765	Out of order
			19-1	766	Out of order
			19-5	767	Out of order
		Fillago small cotton weed	19-4	768	Out of order
		Viola buclor	19-5	769	
		Viola. Woad violet 328	19-5	770	
	Class twentieth gynandria Order first diandria			771	
		A specie of orchis	20-1	772	
		A specie of white orchis	20-1	773	
		Species of orchis	20-1	774	
		Helleborus. Cates Hellebore Linadorum. Linn	20-1	775	Sample is not a hellebore
	Order second triandria Class twentieth gynandria			776	
		Sisyrinchum major May 23rd - 63	20-2	777	
	Order fifth Hexandria Class twentieth gynandria			778	Loose
	Order fourth tentrandria Class twenty first monoecia			779	Loose

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
5	Class twenty first monoecia Order third triandria			780	Loose
		Birthwort with heart shap'd leaves. Aristolochia 37	20-5	781	Loose
		Buxus. Box. Gold edg'd	21-4	782	Loose
			21-3	783	Loose
		Urtica dioica. Hud. 355 Common nettle	21-4	784	Hudd 355 Loose
		Typha latifolia. Hud 345 Great Cat's-tail or reed-mace	21-3	785	Hudd. 345
	Order fifth pentandria Class twenty-first monoecia			786	
		Amaranthus princes feather Or flower gentle	21-5	787	
		Amaranthus flower gentle Or love lies bleeding	21-5	788	
	Order eight polyandria Class twenty-first monoecia			789	
		Myriophyllum. Water millfoil. Hud. 357	21-8	790	
		Water millfoil. Hud. 357. Miriophyllum	21-8	791	
		Quercus Evergreen oak . June	21-8	792	
		Quercus robur Common oak. Hud.	21-8	793	
		Strip'd leav'd Oak Quercus	21-8	794	
		Fagus Castania Hud. Page 359	21-8	795	
	Order ninth monadelphia Class twenty first monoecia			796	
		Pinus. Silver fir	21-9	797	
		Flura. Sand box	21-9	798	
		Cupressus. Cypress Malta	21-9	799	
		Arbour Vitea. I. full of life Thuya	21-9	800	
	Class twenty-second Dioecia Order second Diandria			801	
		Centaurea major vulgaris	19-3	802	Loose, out of sequence
		Salix repens Hud. 365	22-2	803	
		Salix Hud. 365	22-2	804	
		Salix. A specie of willow	22-2	805	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
5	Order fifth pentandria Class twenty second dioica			806	
		Lupulus, Male hop Humulus. Hud 369	22-5	807	
		Hemp Cannabis. 356	22-5	808	
	Order seventh octandria Class twenty second Dioecia			809	
		Rhodiola, roseroot 260 Hud. 370	22-7	810	
	Order eight enniandria Class twenty second Dioecia			811	
		Mercurialis. Wood or Dogs Mercury. 202. Hud. 371	22-8	812	
	Order eleventh monadelphia Class twenty second dioecia			813	
		Strip'd savin. Juniperus	22-11	814	
	Order 12th syngenesia Class twenty second dioecia			815	
		Ruscus. Broad leav'd	22-12	816	
	Order 13th gynandria Class twenty second dioecia			817	
		Clusia with oval Entire Leav's	22-13	818	
	Class twenty third polygamia Order first monoecia			819	
		Valantia. Cross wort. 337	23-1	820	
		Nettle tree Celtis	23-1	821	
		Atriplex portulacoides Sea purslane Hud. 376	23-1	822	
		Atriplex. Orach 352	23-1	823	
		Acer Campestris	23-1	824	
		Amber tree	23-2	825	
	Order third trioecia Class 23rd polygamia			826	
		Ficus. Fig commonly called indian gad tree	23-3	827	
	Class 24th cryptagamia Order first filices			828	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. Ref.	Further information
5		Marsh horse tail. Hud. 380 Equisetum palustre	24-1	829	
		Equisetum palustre. Hud. 380. Johnson 1114 Marsh horsetail	24-1	830	
		Equisetum. Naked horse tail	24-1	831	
		Equisetum. Wood horse tail	24-1	832	
		Osmunda. June. Osmunda regalis. Flowering fern. Hud. 382	24-1	833	
		Filix. Water fern. Orosmund royall. Osmunda regalis. Hud 382	24-1	834	
		Filix mas. Male fern 99 Pteris. Hud 384	24-1	835	
		Asplenium adiantum nigrum. Black maidenhair Hud. 186 108	24-1	836	
		A specie of Hypnum	24-1	837	
			24-2	838	
			24-1	839	
			24-1	840	
		102		841	
		Asplenium. Spleenwort. 31. Hud 385	24-1	842	

Volume 6

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
6			1-1	847	
			1-1	848	
		Jasminum officinale flore albo. Linn. 9	2-1	849	
		Jasminum Fruticans, yellow Jasmine. L. 9	2-1	850	
		Jasminum azoricum, Lin. Spec. pl. 9. Azorian Jasmine	2-1	851	
			2-1	852	
			5-1	853	Out of order
		Syringa with flowers almost white Commonly called persican Jasmine	2-1	854	
		Syringa vulgaris, Lin. Spec. pl. 11. Lilac	2-1	855	
		Salvia officinalis, Lin. Spec. 34. Common red sage	2-1	856	
		Veronica sputia, Lin. Spec. pl. 13. Long leaved Blue spiked Speedwell.	2-1	857	
		Veronica arvensis, Lin. Spec. pl. 18. Hud. 6. Ger. Lin. 613. Park. 762. Speedwell or chickweed.	2-1	858	
		Veronica Bellidoides Lin. Spec. pl. 15	2-1	859	
		Veronica agrestis, Lin. Sp. Plant. 18. Hud. 6. Ger. 616. Park 764. Procumbent garden Speed Well		860	
		Veronica Serpyllifolia, Lin. Sp. Plant. 15. Hud. 4. Park. 551 Ger. 627. Smooth Speedwell or Pauls Betony.		861	
		Veronica officinalis, Lin. Sp. Plant 14. Hud. 4. Park 550. Ger 626. Male speedwell	2-1	862	
			2-1	863	
			2-1	864	
			2-1	865	
		Monarda fistulosa, Lin. 32. Mill. Fig. Plant J. 183. Scarlet Leonurus, Oswego Tea and Lion's Tail.	2-1	866	
		Valeriana rubra, Lin. 44. Red Valerian	3-1	867	
			3-1	868	
		Valeriana Locusta. Corn Sallet. Hud. 12. Lin. 47	3-1	869	
		[in pencil] Yellow water iris	3-1	870	
		[in pencil] Iris fotidissima. Stinking iris	3-1	871	
		Gladiolus, folius ensiformibus, floribus ancipitibus. Mill. Corn flag with flowers growing on each side of stalk.	3-1	872	
			3-1	873	
		Scirpus palustris, Club rush. Hud 16. Linn 70. [in pencil] Eleacharis palustris	3-1	875	
		Scirpus Cespitosius, Dwarf club rush. Hud. 16. Lin. 71.	3-1	876	
		Scirpus fluitans, Floatin club rush. Hud 17. Lin 71.	3-1	877	
			3-1	878	
			3-1	879	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
6		Scirpus maritimus, round rooter Basterd Cyperus. Lin 74. Hud. 18.	3-1	880	
			3-1	881	
		Ernophorum polystachion, Cotton Grass. Hud. 19. Lin. 76.	3-1	882	
			3-1	883	
			3-1	884	
		Phalaris canariensis, Lin. Spec. pl. 79. Hud. 20. Manured Canary grass	3-2	885	
		Phalaris arundinacea, folio variegato, Lin. Spec. pl. 80 Lady grass, Ladies traces or ribbon grass. Reed Canary grass with a variegated leaf	3-2	886	
		[in pencil] Alopecurus alfonus	3-2	887	
		Phleum pratense Lin. Spec. pl. 87. Hud. 22 Meadow Cat's tiail grass	3-2	888	
		Phleum arenarium, Lin. Spec. pl. 88. Lesser Cat's tail grass.	3-2	889	
		Anthoxanthum ororatum, Vernal grass. Hud. 10. Lin. 40	3-2	890	
		Milium effusum, Lin. Sp. Pl. 90. Hud. 25. Millet grass	3-2	891	
		Agrostis spica venti, Lin. Spec. pl. 91. Hud. 26. Silky bent grass		892	
		Aira cristata, Lin. Spec. pl. 94. Hud. 28. Crister hair-grass	3-2	893	
			3-2	894	
		Aria praecox. Lin. Spec. pl. 97. Hud. 31. Early Hair-grass	3-2	895	
		Aria aquatica, Water aria. Hud. 29. Lin. 95	3-2	896	
		Poa pratensis. Lin. Spec. pl. Hud. 33. Great meadow grass		897	
				898	
		Aria caryoplylla, Lin. Spec. pl. 97. Hud. 31. Silver hair-grass	3-2	899	
			3-2	900	
			3-2	901	
		Holcus lanatus, Lin. Sp. Pl. Hud. 374. Meadow soft-grss	3-2	902	
			3-2	903	
		Holcus mollis. Lin. Sp. Pl. Hud. 374. Creeping soft grass	3-2	904	
		Festuca vivipora, Lin. Sp. Pl. 108. Hud. 36. Sheeps Fescue grass	3-2	905	
		Festuca elatior, Lin. Spec. pl. 111. Festuca pratensis, Hud. 37. Meadow fescue grass.	3-2	906	
			3-2	907	
		Bromus secalinus, Hud. 39. Field Brome grass Bromus mollis, Lin. Spec. pl. Soft Brome grass	3-2	908	
		Bromus giganteus, Lin. Spec. pl. 114. Hud. 40. tall Brome grass.	3-2	909	
		Bromus		910	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
6		Auena sativa. Lin. Sp. Pl. 118. Common white oat.	3-2	911	
			3-2	912	
		Auena pratensis, Lin. Sp. Pl. 119. Hud. 42. Meadow oat grass.	3-2	913	
		Auena	3-2	914	
		Lolium ternulentum, Lin. Sp. Pl. 122. Hud. 44. Annual Darnel grass	3-2	915	
		Friticum turgidum, Lin. Sp. Pl. 126. Pollard or duck bill wheat. Mill Dict.	3-2	916	
			3-2	917	
		Hordeum murinum, Lin. Sp. Pl. 126. Hud. 46. Wall Barley Grass	3-2	918	
		Cynosurus cristatus, Lin. Sp. Pl. 105. Hud. 47. Crested dog tail grass	3-2	919	
			3-2	920	
				921	
				922	
			3-2	923	
			3-2	924	
			3-2	925	
			3-2	926	
			3-2	927	
			3-2	928	
			3-2	929	
			3-2	930	
			3-2	931	
			3-2	932	
		Montia fontana, Lin. Sp. Pl. 129. Hud. 48. Curt. Flor. Lord. No. 8. small water Chick-weed, by some called Blinks		933	
		Scabiosa stellata, Lin. Sp. Pl. 144. Sweet scented Indian Scabious. See Mill. Dict. No. 15	4-1	934	
			4-1	935	
		Scabiosa sucissa, Lin. Sp. Pl. 142. Hud. 50. Devil's bit. Morsus diaboli vulgaris, flore purpurea. Park 491.	4-1	936	
		Scabiosa arvensis, Lin. Sp. Pl. 143. Hud. 50. Common field scabious. Scabiosa pratensis hirsuta, Bank. Pin. 269	4-1	937	
		Plantago media, Lin. Sp. Pl. 163. Hud. 51. Hoary Plantain.	4-1	938	
		Sherardia arvensis, Lin. Spec. Pl. 149. Hud. 54. Little field madder. Rubia pratensis minor caerulea, Park 276	4-1	939	
		[in pencil] Asferula odorata. Ourent(?) woodruff	4-1	940	
			4-1	941	
		Asperula cynanchia Lin. Spec. pl. 151. Hud. 55. Squinancy wort.	4-1	942	
		Gallium uliginosum, Lin. Spec. pl. 153. Hud. 56. Marsh Goose grass	4-1	943	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
6		Gallium palustre, Lin. Spec. pl. 153. Hud. 57. White Ladie's Bedstraw	4-1	944	
		Gallium pusillum, Lin. Spec. pl. 154. Hud. 56. Least Ladie's Bedstraw.	4-1	945	
			4-1	946	
		Gallium aparine, Lin. Spec. pl. 157, Hud. 57. Cleavers or goose grass	4-1	947	
		Gallium boreale, Lin. Spec. pl. 156. Hud. 58. Cross wort madder	4-1	948	
		Alchemilla vulgaris, Lin. Spec. pl. 178. Hud. 59. Ladies Mantle. Alchemilla major vulgaris, Park 538	4-1	949	
			4-1	950	
		Rivina humilis, Lin. Spec. pl. 177. Rivina with Nightshade leaves	4-1	951	
		Cornus sanguinea, Lin. Spec. pl. 171. Female Dog wood. Bloody Twig	4-1	952	
		Potamogeton gramineum, Lin. Spec. pl. 184. Hud. 62. Glass leaved Pond weed.	4-3	953	
		Potamogeton pusillum, Lin. Spec. pl. 184. Hud. 6. small grass leaved pondweed	4-3	954	
		Potamogeton natans, Lin. Spec. pl. 182. Hud. 60. Broad leav'd pondweed. Fontalis major latifolia vulgaris. Park. 1254.	4-3	955	
		Ilex aquifolium, Lin. Spec. pl. 181. The common Holly.	4-3	956	
		Sagina procumbens, Lin. Spec. pl. 185. Hud. 63. Pearl wort or chick weed = Breakstone. Saxifraga angelicana alsine folio Ger 568.	4-3	957	
			4-3	958	
		Sagina erecta, Lin. Spec. pl. 185. Hud. 64. the least stitch wort. Alsine verna glabra. Vaill paris p.6. t.3. f.2.	4-3	959	
		Sagina annual Pearl-wort. And Linum. A Specie of flax		960	No sample
		Philadelphus coronarius, Lin. Spec. pl. 671. Mock orange.	5-1	961	
		Ulmus campestris, Lin. Spec. pl. 327. Hud. 94. Common Elm. Ulmus vulgaris, Park. 1404	5-2	962	
		Lonicera alpigena, Lin. Spec. pl. 248. Dwarf alpine cherry Commonly called upright Honeysuckle. Mill Dict. No. 2.	5-1	963	
			5-1	964	
			5-1	965	
			5-1	966	
		Borago officinalis, Lin. Spec. pl. 197. Hud. 68. Borage	5-1	967	
		Borago orientalis, Lin. Spec. pl. 197. Borage of Constantinople		968	
			5-1	969	
		Echium vulgare. Lin. Spec. pl. 200. Hud. 69. Vipers Bugloss	5-1	970	
		Primula veris. Lin. Spec. pl. 204. Hud. 70. Pagils or cowslips	5-1	971	

Vol.	Classification notes	Notes on page	W.C's No.	Pic. ref.	Further information
6		Primula auricula, Lin. Spec. pl. 205. Bear's Ear	5-1	972	
			5-1	973	
		Primula formosa, Lin. Spec. pl. 205. Hud. 71. Polyanthus	5-1	974	
		Menyanthes trifolia, Lin. Spec. pl. 208. Hud. 71. Marsh trefoil, or Buck-bean	5-1	975	
		Hottonia palustris, Lin. Spec. pl. 208. Hud. 72. Water violet	5-1	976	
		Lysimachia vulgaris, Lin. Spec. pl. 209. Hud. 72. Yellow willowherb or loosestrife	5-1	977	
		Lysimachia mesnorum, Lin. Spec. pl. 211. Hud. 73. yellow pimpernell of the woods.	5-1	978	
			5-1	979	
		Lysimachia numularia, Lin. Spec. pl. 211. Hud. 73. money wort	5-1	980	
		Lysimachia vulgaris, Lin. Spec. pl. 209. Hud. 72. yellow willow herb, or loosestrife		981	
		Lysimachia atropurpurea, Lin. Spec. pl. 209. Narrow leaved. Eastern loosestrife with a purple flower.		982	
		Anagalis arvensis, Lin. Spec. pl. 211. pimpernell	5-1	983	
		Anagalis monelli, Lin. Spec. pl. 211. Blue flowered pimpernell	5-1	984	
			5-1	985	
		Convolvulus Lusitanicus flore cyaneo Bross. Portugal bindweed with a blue flower. Mill. Dict.	5-1	986	
		Polemonium flore albo, Greek Valerian with a white flower	5-1	987	
		Polemonium reptans. Lin. Spec. pl. 230. Valerian with a creeping root.	3-1	988	
			3-1	989	
		Hyoscyamus niger, Lin. Spec. pl. 257. Hud. 77. Common henbane	5-1	990	
		Nicotiana Tabacum, Lin. Spec. pl. 258. Great narrow leaved Tobacco	5-1	991	
			5-1	992	
			5-1	993	
			5-1	994	
		Solanum sodorneum, Lin. Spec. pl. 268. Love apple or Pomum amorio.	5-1	995	
		Solanum melongena, Lin. Spec. pl. 266. Madapple or Egg Plant	5-1	996	
			5-1	997	
		Solanum bonariense, Lin. Spec. pl. 264	5-1	998	
			5-1	999	
			5-1	1000	
		Polygonum Convolvus, Lin. Spec. pl. 522. Hud. 149. Black bind weed		1001	No sample
		Polygonum orientale, Lin. Spec. pl. 519. Oriental arse smart		1001	No sample

Unbound Volume

Vol.	Classification notes	Notes on page	W.C's no.	Pic. ref.	Further information
Unbound			24-3	1501	Out of order
		Lycium afaum (?), Lin. Spec. pl. 277. Boxthorn with linear leaves	5-1	1502	
		Euonymus tenuifolis, Lin. Spec. pl. 286. Common Spindle Tree.	5-1	1503	
		Glaux martima, Lin. Spec. pl. 301.Hud. 86. Sea milkwort	5-1	1504	
		Vinca minor, Lin. Spec. pl. 304. Periwinkle with a double purple flower	5-1	1505	
		Vinca major, Lin. Spec. pl. 304. Hud. 77. great periwinkle	5-1	1506	
		Vinca rosea, Lin. Spec. pl. 305. Mill. Fab. 186. Periwinkle with a branching shrubby stalk.	5-1	1507	
		Plumbago zeylanica, Lin. Spec. pl. 215. Lead wort	5-1	1508	
		Azalea viscosa, Lin. 214. American upright Honeysuckle.	5-1	1509	
		Convolvulus sepium, Lin. Spec. pl. 218. Hud. 74. Great bindweed	5-1	1510	
		Dodecathon meadia, Bear's ear of Virginia	5-1	1511	
		Achyranthes	5-1	1512	
			5-1	1513	Same as previous sample
		Periploea africana, Lin Spec. pl. 309. Virginian Silk, or African climbing Dogsbane	5-2	1514	
		Chenopodium Bonus Henricus, Lin. Spec. pl. 318. Hud. 89. Common English Mercury, or Allgood	5-2	1515	
		Beta rubra, Lin. Spec. pl. 322. Red Beet	5-2	1516	
		Chenopodium album, Lin. Spec. pl. 319. Hud. 91. Common Orache	5-2	1517	
		Eryngium alpinum, Lin. Spec. pl. 337. Blue Alpine Eryngo.	5-2	1518	
		Hydrocotyle vulgaris, Lin. Spec. pl. 338. Hud. 96. Marsh Pennywort, or White rot	5-2	1519	
		Daucus carota, Lin. Spec. pl. 348. Hud. 99. Wild Carrot, or Bird's Nest	5-2	1520	
		Daucus mauritanicus, Lin. Spec. pl. 348. Manured Carrot, commonly called Orange Carrot.	5-2	1521	
		Bunium Bulbocastanum, Lin. Spec. pl. 349. Hud. 105. Earth nut		1522	
		Ligusticum Scoticum, Lin. Spec. pl. 359. Hud. 102. Scottich Sea Parsley	5-2	1523	
			5-2	1524	
		Angelica sylvestris, Lin. Spec. pl. 361. Hud. 103. Wild Angelica	5-2	1525	
		Angelica sylvestris, folus variegatus	5-2	1526	
		Oenanthe fistulosa, Lin. Spec. pl. 365. Hud. 104. Water Dropwort		1527	
			5-2	1528	
		Anthusa (?) cynapium. Lin. Spec. pl. 367, Hud. 107. Fool's Parsley		1529	
			5-2	1530	
		Scandisa antriscus, Small hemlock Chervil with Rough seeds. Hud. 108. Lin. Spec. pl. 368. Park. 935. Ger. 1038		1531	

Vol.	Classification notes	Notes on page	W.C's no.	Pic. ref.	Further information
U		Chaerophyllum termulum, Lin. Spec. pl. 370. Hud. 108. Wild chervil		1532	
				1533	
		Chaerophyllum termulum, Lin. Spec. pl. 370. Hud. 108. Wild Chervil	5-2	1534	
			5-2	1535	
		Seseli Caruifolia, Hud. 106. Meadow Saxifrage Seseli pratensis Nostras. Prk 905. R. Syn. 216 Saxifraga anglica facie seseli pratensis, Ger Ern 1047 Caruifolia, Val. Paris. T. 5. f. 2	5-2	1536	
		Anethum foeniculum, Lin. Spec. pl. 377. Hud. 110. Finkle, or Fennel	5-2	1537	
		Carum carvi, Lin. Spec. pl. 378. Caraway	5-2	1538	
		Apium graveolens. Lin. Spec. pl. 379. Upright celery	5-2	1539	
				1540	
		Conium africanum. Lin. Spec. pl. 350. African Hemlock	5-	1541	
		Aegopodium podagraria, Lin. Spec. pl. 379. Hud. 111. Herb Gerardi	5-2	1542	
			5-3	1543	
		Rhus cotinus, Lin. Spec. pl. 383. Venice Sumach. Or Coccygria	5-3	1544	
		Viburnum tinus, Lin. Spec. pl. 383. Strip'd leav'd Laurus tinus	5-3	1545	
		Viburnum Opulus, Lin. Spec. pl. 384. Guelder Rose with flat flowers. Viburnum from George Caleys moor. June	5-3	1546	
		Viburnum roseum, Lin. Spec. pl. 384. Globe Guelder Rose	5-3	1547	
		Sambucus nigra, Lin. Spec. pl. 385. Common elder with black berries	5-3	1548	
		Staphylea pinnata. Lin. Spec. pl. 386. Hud. 113. Five leaved Bladder Nut Tree	5-3	1549	
			5-3	1550	
		Alsine media, Lin. Spec. pl. 389. Hud. 113. Common chickweed	5-3	1551	
		Basella rubra, Lin. Spec. pl. 390. Climbing Malabar Nightshade. From the Berries of this sort I have seen a beautifull Colour drawn.	5-3	1552	
			5-3	1553	
			5-5	1554	
		Statice armeria, Lin. Spec. pl. 394. Hud. 114. Thrift, Sea Gilly flower	5-5	1555	
		Linum usitalifimum, Lin. Spec. pl. 397. Hud. 115. Manured flax	5-5	1556	
		Linum verticillatum, Lin. Spec. pl. 402	5-5	1557	
		Linum catharticum, Lin. Spec. pl. 401. Hud. 116. Purging flax	5-5	1558	
		Drosera rotundifolia, Lin. Spec. pl. 402. Hud. 117. Round leav'd Sundew	5-5	1559	
		Galanthus nivalis, Lin. Spec. pl. 413. Least bulbous Snow Drop with three leaves	6-1	1560	

Vol.	Classification notes	Notes on page	W.C's no.	Pic. ref.	Further information
U		Galanthus nivalis, varietas. Snow Drop with a double Flower	6-1	1561	
		Allium vineale, Lin. Spec. pl. 428. Hud 121. Crow Garlick	6-1	1562	
		Allium ursinum, Lin. Spec. pl. 431. Hud. 122. Ramson	6-1	1563	
		Fritillaria meleagris, Lin. Spec. pl. 436. Early, purple, variegated, Chequer'd Tulip	6-1	1564	
		Tulipa gesneriana, Lin. Spec. pl. 438. Common tulip with its varieties	6-1	1565	
		Asphodelus luteus, Lin. Spec. pl. 443. King's Spear with a yellow flower	6-1	1566	
		Asparagus officinalis, Lin. Spec. pl. 448. Garden Asparagus	6-1	1567	
		Convalaria multiflora, Lin. Spec. pl. 452. Hud. 126. Solomon's Seal	6-1	1568	
		Peplis portula, Lin. Spec. pl. 474. Hud. 128. Water Purslane.	6-1	1569	
		Convallaria majalis, Lin. Spec. pl. 451. Hud. 126.Lily convally	6-1	1570	
		Hyacinthus non scriptus, Lin. Spec. pl. 453 Hud. 123. English Hyacinth	6-1	1571	
			6-1	1572	
		Oryza sativa, Lin. Spec. pl. 475. Rice	6-2	1573	
			6-1	1574	
		Hyacinthus muscaria, Lin. Spec. pl. 454. Feathered Hyacinth	6-1	1575	
		Rumex Acetosella, Lin. Spec. pl. 481. Hud. 136. Sheep's Sorrel	6-3	1576	
		Aloe viscosa, Lin. Spec. pl. 460. Triangular leaved Aloe	6-1	1577	
		Rumex, Lin. Spec. pl. 480. Hud. 135. round leaved Mountain Sorrel. French Sorrel	6-3	1578	
		Hemerocallis fulva, Lin. Spec. pl. 462. Yellow asphodel Lily or Day Lily	6-1	1579	
		Friglochin palustre, Lin. Spec. pl. 482. Hud. 133. Arrow headed grass.	6-3	1580	
		Juncus articulatus, Lin. Spec. pl. 465. Hud 130. Rushgrass	6-1	1581	
		Petiveria alliacea, Lin. Spec. pl. 486. Guinea Henweed	6-4	1582	
			6-4	1583	
		Juncus bulbosus, Lin Spec. pl. 466. Hud. 131. Bulbose Rush	6-1	1584	
		Alisma ranculoides, Lin Spec. pl. 487. Hud. 137. Small water Plantain	6-5	1585	
			12-5	1586	
		Aesculus Hipocastanum, Lin Spec. pl. 488. Horse chestnut	7-1	1587	
		Aesculus folus variegatus, Striped leaved Horse Chestnut	7-1	1588	
		Berberis vulgaris, Lin Spec. pl. 471. Hud. 119. Barberry	6-1	1589	
			8-1	1590	

Vol.	Classification notes	Notes on page	W.C's no.	Pic. ref.	Further information
U		Erica vulgaris, Lin Spec. pl. 501. Hud. 144. Common Heath, or Ling	8-1	1591	
		Erica		1592	
		Epilobium angustifolium, Lin Spec. pl. 493. White Willow Herb or French Willow	8-1	1593	
			8-1	1594	
		Polygonum Bistorta, Lin Spec. pl. 516. Hud. 146. Great Bistort, or Snake Weed	8-3	1595	
			8-3	1596	
		Polygonum viviparum, Lin Spec. pl. 516. Hud. 147. Small Bistort, or Snake weed.	8-3	1597	
			8-3	1598	
		Polygonum persicaria, Lin Spec. pl. 518. Hud. 147. dead or spotted arsmart		1599	
		Polygonum aviculare, Lin Spec. pl. 519. Hud. 149. Knot grass	8-3	1600	
			9-1	1601	
		Paris quadrifolia, Lin Spec. pl. 526. Hud. 150. Herb Paris, or One berrie	8-4	1602	
		Sophora occidentalis, Lin Spec. pl. 533. Galega fruticosa. Brown Jam, 289.t.31.f.1. Jointed poded Colutea of Ceylon, allover Silvery.	10-1	1603	
		Arbutus unedo, Lin Spec. pl. 566. The common Strawberry Tree	10-1	1604	
				1605	
		Clethra alnifolia, Lin Spec. pl. 566. Clethra with a long spike of flowers	10-1	1606	
		Clethra alnifolia, Lin Spec. pl. 566. Clethra with a short spike of flowers	10-1	1607	
		Saxifraga umbosa, Lin Spec. pl. 574. Great roundish leaved Kindey wort, with a red Pointal to the flower, called London Pride or None so pretty	10-2	1608	
			10-2	1609	
		Saxifraga Geum, Lin Spec. pl. 574. Round Leaved Kidneywort	10-2	1610	
			10-2	1611	
		Saxifraga granulata, Lin Spec. pl. 576. White Saxifrage	10-2	1612	
			10-2	1613	
		Dianthus, Common Garden Pink	10-2	1614	
		Dianthus Chinensis, Lin Spec. pl. 588. China Pink	10-2	1615	
		Stellaria Holostea, Lin Spec. pl. 603. Hud. 166. Great Stitchwort	10-3	1616	
			10-3	1617	
		Stellaria. Great Stitchwort	10-3	1618	
		Cucubalus Bacciferus, Lin Spec. pl. 591. Hud. 163. berry bearin Chickweed.	10-3	1619	
		Arena laricifolia, Lin Spec. pl. 607. Hud. 168. Larch Leaved Chickweed	10-3	1620	
		Malpighia glabra, Lin Spec. pl. 609. commonly called Barbadoes Cherry	10-3	1621	

Vol.	Classification notes	Notes on page	W.C's no.	Pic. ref.	Further information
U		Cotyledon umbilicus, Lin Spec. pl. 615. Great Navelwort	10-4	1622	
		Sedum dasphyllum, Lin Spec. pl. 618. Lesser house leek with a roundish leaf	10-4	1623	
		Sedum annum, Lin Spec. pl. 620. Hud. 172. Mountain Stonecrop	10-4	1624	
		Sedum Telephium, Lin Spec. pl. 616. Hud. 170. Orpine or Live long.	10-4	1625	
		Sedum reflexum, Lin Spec. pl. 618. Hud. 170. Stone crop or Prick madam.	10-4	1626	
		Sedum Telephium purpureo, Lin Spec. pl. 616. Hud 170. Small purple Orpine or Live long.	10-4	1627	
		Agrostemma coronaria, Lin Spec. pl. 625. Single Rose Campion.	10-4	1628	
		Spergula arvensis, Lin Spec. pl. 630. Hud. 177. Corn Spurrey	10-4	1629	
		Spergula nodosa, Lin Spec. pl. 630. Hud. 178. Knotted Spurrey or English Marsh Saxifrage	10-4	1630	
		Cerastium vulgatum, Lin Spec. pl. 627. Hud. 175. Narrow leaved mouse ear Chickweed	10-4	1631	
		Asarum europaeum, Lin Spec. pl. 633. Hud. 179. Asarabacca	11-1	1632	
		Agrimonia Eupatoria, Lin Spec. pl. 643. Hud. 180. Agrimony	11-2	1633	
			11-2	1634	
				1635	
		Potentilla reptans, Lin Spec. pl. 714. Hud. 197.Common Cinque foil	12-5	1636	
		Reseda alba, Lin Spec. pl. 645. Upright Mignorette of Egypt	11-3	1637	
			11-3	1638	
		Reseda odorata, Lin Spec. pl. 646. Sweet Mignonette	11-3	1639	
		Euphorbia exigua, Lin Spec. pl. 654. Hud. 182. Dwarf spurge. Fithymalus leptophyllus Park. Theat. 193. Small annual spurge	11-3	1640	
			11-3	1641	
		Euphorbia, Amygdaloides. Woodspurge	11-3	1642	
		Euphorbia platyphyllus, Lin Spec. pl. 660. Hud. 184. Broad leaved spurge	11-3	1643	
				1644	
		Sempervivum arboreum, Lin Spec. pl. 664. House leek tree	11-5	1645	
			12-5	1646	
			12-1	1647	
			12-5	1648	
			12-5	1649	
			12-5	1650	
		Ajuga Common. May 11th - 63	12-4	1651	
				1652	

Vol.	Classification notes	Notes on page	W.C's no.	Pic. ref.	Further information
U		Amygdalus nana, Lin Spec. pl. 677. Single flowering dwarf almond	12-1	1653	
		Crataegus aria, Lin Spec. pl. 281. white Beam, or white Leaf Tree	12-2	1654	
		Crataegus oxyeantha, Lin Spec. pl. 683. Hud. 188. White Thorn, or Haw thorn	12-2	1655	
		Sorbus amarparia, Lin Spec. pl. 683. Hud. 189. Quicker tree, or Mountain Ash	12-3	1656	
		Rosa, Double Velvet Rose	12-5	1657	
		Pyrus Blackpear of Worcester	12-4	1658	
			12-4	1659	
		Mespilus canadensis. Lin Spec. pl. 685	12-4	1660	
		Mespilus	12-4	1661	
		Mespilus neopolitan	12-4	1662	

APPENDIX 4:

CORRELATIONS BETWEEN BURTON CONSTABLE LIVE COLLECTIONS FROM PLANT BILLS AND THE *HORTUS SICCUS*

Plant	*Hortus Siccus* volume	Plant bill
Acacia	Vol 3	Chris Gray 1759
Agnus castus	Vol IV	Chris Gray 1759
Aloe	Vol 2. note states 'Aloe, Triangular Leav'd'.	Possible link - four specific species of Aloe purchased from Robert Black in 1760
Amaranthus	Vol 5	Perfect's Dec 1762
Arbutus	Unbound volume	Chris Gray 1759
Asarum europeaum (asarabacca)	Unbound volume	Perfect's 1762
Bead tree	Vol 2	Chris Gray 1759
Bladder senna	Vol VI	Chris Gray 1759
Christ Thorn	Vol VI	Chris Gray 1759
Coccygria	Unbound volume	Chris Gray 1759
Cornish Elm	Vol VI	Perfect's December 1779
Cytisus	Vol 4	Chris Gray 1759
Dahoon Holly	Vol VI	Chris Gray 1759
Deciduous cypress	Vol V and VI	Chris Gray 1759
Delphinium (larkspur)	Vol 3	Perfect's Oct 1762
Double Dwarf almond	Vol 3	Chris Gray 1759
Egg plant	Vol 6	Perfect's 1762
Evergreen privet	Vol VI, Vol 1	Robert Black bill 1760
Fennel	Unbound volu	Chris Gray 1759
five leav'd bladder nuts	unbound volume	Robert Black bill 1760
Laurustinus	Vol 2	Robert Black bill 1760
Lilac	Vol VI	Robert Black bill 1760
Magnolia	Vol 3	Chris Gray 1759
Manna Ash	Vol VI	Perfect's December 1779
Neopolitan Medlar	Vol IV	Chris Gray 1759
Nettle tree	Vol VI	Chris Gray 1759
Olive leaved Phillyrea	Vol 1	Chris Gray 1759
Phillyrea	Vol 1 has 4 specimens	10 Phillyreas from Robert Black 1760
Populus (tacamahaca)	Vol VI	Robert Black bill 1760
Rosemary leaved Phillyrea	Vol 1	Chris Gray 1759
Scarlet Oak	Vol VI	Perfect's December 1779
Single virgins bower	Vol 3	Chris Gray 1759
Spanish broom	vol VI	Robert Black bill 1760 and Chris Gray 1759
Spiraea frutex	Vol 3	Robert Black bill 1760
Striped Laurustinus	Vol 2	Chris Gray 1759
Sumach	Vol VI	Chris Gray 1759
Syringa	Vol 1 (3 samples) and Vol6	6 from Robert Black 1760
Trumpet Flower	Vol VI	Chris Gray 1759

Plant	***Hortus Siccus* volume**	**Plant bill**
Tulip Tree	Vol VI	Chris Gray 1759
Virginia maple	Vol VI	Chris Gray 1759
Virginian flowering Ash	Vol VI	Perfect's December 1779
Witch Elm	Vol VI	Perfect's December 1779
Yellow Jessamine	Vol 1	Robert Black bill 1760

ABBREVIATIONS

ERRO: East Riding Records Office

UNMSC: University of Manchester

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