A Utopian Quest for Universal Knowledge:

Diachronic Histories of Botanical Collections between the Sixteenth Century and the Present

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Epilogue: The Skein of Life
Acknowledgements

This thesis explores and plays with the old trope of the book as garden. Anyone who has tried their hand at gardening (or struggled to nurture potted plants on their windowsill) will understand that plants cannot be taken for granted. They need many things for them to survive and thrive in the places they are planted. The same is true of this thesis. It has grown through a great deal of generosity, kindness and support from strangers as well as colleagues and loved ones. I cannot thank you enough. It is not possible to mention everyone here by name here, but please know that I am grateful.

The thesis was enabled and initially funded by the Environmental Humanities Laboratory, before receiving funding from the Swedish Research Council for a three-year project with Sabine Höhler entitled "Saving Nature: Conservation Technologies from the Biblical Ark to the Digital Archive.” The security of this employment has minimised the distraction of practical concerns, as well as enabling travel to workshops and collections as far away as Australia. I owe a great deal to my supervisors Sabine Höhler, Peder Roberts and Sverker Sörlin. Beyond providing support and critical feedback, they created a spacious environment in which to think and try new things, without which this thesis would not have been possible. I have also benefitted greatly from the rich and generously shared store of knowledge from my colleagues and friends at the Division of History of Science, Technology and Environment. I will miss you! Isabel, thank you for four and a half years as my office mate, and paving the way in such an exemplary fashion. Hanna, thank you for the many miles we’ve walked and talked. Johan, thank you for trading texts and making the improbable materialise. Emilia and Sofia, thank you for all your work in making the procedural logistics manageable.
At particular points along the way, Jenny Beckman and Jim Endersby’s critical readings of earlier drafts of the thesis have been invaluable in the process of turning a collection of papers into a thesis. Stephen Harris has been instrumental to the research behind Paper I and Paper II, generously sharing his knowledge of the collections and providing feedback. Given the project’s breadth in scope, I am grateful for the input of William Poole, Lauren Kassell, Scott Mandelbrote, Hans Helander, Thom van Doornen, Otto Sibum and Helen Hartley, and many others. Several people have provided valuable feedback on individual parts of the text, including Kit Heintzman, Guy Mathers, Lisa Backman, Johan Gärdebo, Anne Gough, and the editors of the anthology in which Paper II will be published (Helena Ekerholm, Karl Grandin, Christer Nordlund Patience Schell).

I wish to extend a special thank you to all the librarians and herbarium curators I have consulted for this project, particularly Helena Backman and Anne Marie Catterall, via email and in person. They have not only responded to my questions about fragile and often uncatalogued material, but shared experiences and insights that I could not have accessed otherwise and handled questions concerning image reproduction. On this last point I particularly want to thank the staff at the imaging services at the British Library and at the Bodleian Library, University of Oxford.

David and Ida, thank you for providing a home in Oxford and for wisdom over breakfast, and Sue and Stewart for a home in Cambridge. Emma, thank you for hearty conversations and for putting up with my comings and goings. The women’s eight and everyone else at Hammarby Rodd, thank you for keeping me going. More recently, several natural dyers in Stockholm have contributed knowledge and fabric, especially Petra Holmberg, Kaili Maide and Kerstin Neumuller and Douglas Luhanko,
My parents, Jenny, Ester and Marcus: thank you for indulging my flower obsession and hoarding habits from the beginning. Thank you for sharing the rich particularities of a life shaped between northern Pakistan, various international communities and the forests of Småland – my patched world would not make sense without you. Moni, Nadja, and Jaffar thank you for joining us. Myrra, Ilmi, Iro, Nooria and Abraham, I worry sometimes that we are leaving you an impoverished world; I hope you will always be as interested and fascinated by it as you seem to be now.

Karl, rose of my heart, thank you for being been part of this nearly from the beginning, with patience, encouragement and a miraculous capacity to fix footnotes. Thank you for giving me the dyeing pot, and then cheerfully living with the consequences. Much love.
Summary and Keywords

This thesis explores the history of botany as a global collection-based science by tracing parallels between utopian traditions and botanical collecting, from their sixteenth-century beginnings to the present. A range of botanical collections, such as gardens, herbaria and classification systems, have played a central role in the struggle to discover a global or universal scientific order for the chaotic, diverse and locally shaped kingdom of plants. These collections and utopia intersect historically, and are characterised by the same epistemology of collecting: the creation of order through confined collecting spaces or “no-place.” They are manipulations of space and time. Between chaos and order, both seek to make a whole from – often unruly – parts.

The long history of botanical collecting is characterised by a degree of continuity of practice that is unusual in the sciences, something which is particularly true of the herbarium. The basic technology of preserving plants by mounting and labelling dried specimens on paper has been in use for almost five centuries, from sixteenth-century Italy, through the vast institutional herbaria of the eighteenth-century empire, and remains at the centre of ongoing digitisation projects. The format of the compilation thesis is well-suited to handling the historiographical challenge of tracing continuity and discontinuity with such a long chronological scope. It allows for a diversity of periodisation and disciplinary approaches at the local level of each article (such as literature, history of science and history of the book), while sharing the thesis’ focus on ordering through confined collecting spaces.

The thesis is structured as a walled quadripartite garden, with the Kappa enclosing four research papers and an epilogue. The papers take a diachronic approach to explore different perspectives on botanical collections: botanical collecting in seventeenth-century
Oxford, particularly in relation to the founding of the Oxford University Botanic Garden (1621); pressed plants in books that are not formally collections; and the digitisation of botanical collections for the Global Plants database, specifically the Directors’ Correspondence Collection at the Royal Botanical Gardens, Kew. These accounts are all shaped by the world of books, text and publication, historically a male-dominated sphere. In order to acknowledge marginalisation of other groups and other ways of knowing plants, the epilogue is an explanation of an embroidered patchwork of plant-dyed fabric, which forms the cover of the thesis.

**Keywords:**

history of botany, utopia, Oxford University Botanic Garden, pressed plants in books, botanical collection, classification, herbarium, Global Plants, digitisation, database, conservation, natural dyeing
Sammanfattning och nyckelord

Ett utopiskt sökande efter universell kunskap:
diakronisk historieskrivning om botaniskt samlande från femtonhundratalet till idag


(till exempel litteratur, vetenskapshistoria och bokhistoria) samtidigt som de alla delar avhandlingens centrala tematik: ordnande genom avgränsade samlingsutrymmen.


**Nyckelord:**

botanikhistoria, utopi, Oxford University Botanic Garden, pressade växter i böcker, botaniska samlingar, klassifikation, herbarium, Global Plants, digitalisering, databas, växtfärgning
Island where all becomes clear.  
Solid ground beneath your feet.  
The only roads are those that offer access.  

...  
For all its charms, the island is uninhabited,  
and the faint footprints scattered on its beaches  
turn without exception to the sea.  

As if all you can do here is leave  
and plunge, never to return, into the depths.  
Into unfathomable life.  

Wislawa Szymborska  
“Utopia” (extract) 1976¹  

O scenes surpassing fable, and yet true,  
Scenes of accomplish’d bliss! Which who can see,  
Though but in distant prospect, and not feel  
His soul refresh’d with foretaste of joy?  
Rivers of gladness water all the Earth,  
And clothe all climes with beauty; the reproach  
Of barrenness is past. The fruitful field  
Laughs with abundance; and the land, once lean,  
Or fertile only in its own disgrace,  
Exults to see its thistly curse repeal’d.  
The various seasons woven into one,  
And that one season an eternal spring,  
The garden fears no blight, and needs no fence,  
For there is none to covet, all are full.  

William Cowper  
Poems (1808), volume 2 p.197  

This thesis offers perspectives on the history of botany as a collection-based science, exploring how botanical collecting has shaped knowledge about plants from the first collections of pressed plants in sixteenth-century England to the database of the twenty-first century. This long timeframe maps on to the empirical study of plants as a global endeavour that requires extensive travel and collecting, but that is constantly challenged by the diversity, mutability and rootedness of the vegetable kingdom. I approach botanical collections as a set of conservation or preservation technologies that preserve and order through confinement, and through which this global botany has gradually emerged as a cumulative science.

Botanical collections are characterised by the combination of continuity and change, and have been so since the first botanic...
gardens and herbaria were made in sixteenth-century Italy. While living collections in a garden are mutable and, as such, in constant need of tending or replacing, the herbarium makes it possible for collections of plants to be preserved for centuries. In the case of herbaria, the continuities in materiality and practice are particularly clear, despite processes of standardisation and technological developments linked to the ways in which the conceptualisation and use of the herbarium have changed. The long timespan and continuities of this collecting, and indeed some collections, present a challenge to historiographical conventions about how to deal with continuities and change over time.

Thus a basic point of departure is that there are continuities in the role of collections in the history of botany that have not been sufficiently explored, in part because of the long timeframe. Having rejected the teleological progression of Whiggish accounts of the history of botany, such as Julius von Sachs’s History of Botany (1530-1860), many studies of the history of botanical collecting instead focus on networks or ordering technologies. These tend to be synchronic, in the sense that they focus on actors’ categories and detailed contextualisation within relatively narrow temporal limits. This has enriched our understanding of botanical collecting as locally and temporally embedded, and explored ways of bringing out voices silenced by gendered and colonial hegemonies. However, the question of how to analyse the history of botany as processes of continuity and change over

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2 As Stephen Forbes, former director of the Botanic Gardens of South Australia, argues, continuity and flux have been at the heart of botanic gardens from the outset; Stephen J. Forbes, “Collections and Knowledge: Constancy and Flux in a Sixteenth-Century Botanic Garden,” Studies in the History of Gardens & Designed Landscapes 36, no. 4 (2016). Issue 4 is appropriately on “Out of Time: Temporality in Landscape History.”

3 Much has happened since Richard Grove observed in 1995 that “The historiography of botany is not highly developed....” but there is still work to be done. Richard H. Grove, Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860 (New York: Cambridge University Press, 1995), 78.
almost five centuries has received relatively little attention. This is significant in a field that enjoys such extensive scholarship across a wide range of disciplines. While all history is in some sense diachronic, negotiated between the present and the past, I use “diachronic” in this thesis to describe cutting across time that is not necessarily chronological. It is in this sense “heterochronic,” to borrow Michel Foucault’s term, bringing different times together in the same space.4

The compilation thesis is well suited to this approach, as it provides a framework for pursuing each paper independently that remains visible in the final form of the thesis. Collections, certainly botanical collections, encapsulate a limited and imperfect selection of the whole, yet make claims that transcend the particulars they contain. As a collection of diachronic studies spanning from the sixteenth century to the present, this thesis presents perspectives on to the continuities and change at the heart of botanical collecting. It does not offer an exhaustive linear account – given the timeframe, this would be impossible. Rather, the studies are weighted towards the early modern period and the present, while moving between them. In all four articles, the collection is treated as a process, constantly gesturing back in time and outwardly in space, troubling attempts to fix them as an object of study. Thus, while the individual articles in this thesis seek to add new knowledge on the level of content, together they form a set of experiments in writing diachronic histories of botanical collecting – an exploration in the epistemology of collecting.

To analyse botanical collections, a flexible and spacious concept is needed – a concept that can travel through time and space as well as between different kinds of collections. Utopia is well suited to fill this role. It provides a framework through which to analyse

these technologies as manipulations in time and place, highlighting the work required to assemble pieces into a whole, real or imagined. The close links between early modern utopianism and the emergence of botanical collecting reveal similarities in the central role of confinement for the preservation and ordering of the collection. This is a question not of fact or fiction, but of accounting for the manipulations of time and space in pursuit of ideals of order which prioritise the universal or global and the constant or static. Like utopia, the botanical collection is outside space and time; it has a location, but that space is a “no place” in relation to its original context – which in the case of plants entails being rooted and therefore spatially defined, and constantly changing with seasons and life cycles. In these little mirrors of nature, histories of botanical collections also become stories about ourselves.\(^5\) By looking at these histories through the lens of utopia, I wish to denaturalise botanical collecting and assumptions of relevance, beginning with my own.

Utopia evokes both yearnings for the good life, for peace, happiness and prosperity, and an imposition of order at the cost of individual freedom. Between the “good place” and the ideal order of the “no place,” between utopia as full of life and void of life, lies the tension at the heart of the human dependence on the kingdom of plants: some control and order is essential, but too much stifles growth. Diversity is difficult to manage. The main use of utopia in this thesis is as a confined ordering space, by looking how plants are ordered and stabilised through different kinds of botanical collections. However, there are also strong utopian associations with the garden as a particular kind of collection that have to do with utopia as an ideal or good place: a retreat and place of

\(^5\) The emerging field of critical plant studies insists upon the uniqueness of the human-plant relationship, as something which has not been sufficiently recognized or explored. See the introduction to Randy Laist, *Plants and Literature: Essays in Critical Plant Studies* (Amsterdam: Rodopi, 2013).
restoration, particularly from urban squalor; prelapsarian Eden characterised by perfect order, social and natural harmony and fixed species; arcadia as a place of abundance, pleasure. In the utopian tradition islands, real and imaginary, are associated with visions of ease in tropical paradise as well as with restriction and constraint. Collections of plants are well suited to mirroring human society, as human like vegetable subjects are mutable and transient, but therefore also receptive to cultivation.

In Sir Thomas More’s *Utopia* (1516), “Man’s nature is mutable and frail” – so too is man’s knowledge and memory. Knowledge is composite; it is cobbled together from the collection of pieces at hand. Many arrangements are possible, depending upon available tools and technologies. The mind is in this sense the prototypical confined collecting space, shaped by the contingencies of its own embodied narrative in time and space, yet able to abstract and universalise. The mind as an ordering and ordered space reflects a set of parallel pairs that were often linked metaphorically: reason over the passions, the head over the body, man over woman, the king over his “body,” the kingdom. There is a hierarchy of knowledge: that which is universal (true everywhere) is widely considered more true or better truth than that knowledge which is only true locally. In the history of human-plant relations, increasing globalisation has brought about a shift from local knowledges to a search for and dominance of a global or universal knowledge of plants. What laws govern plant diversity, distribution, and change? As plants and humans continue to be bound in time and place, this requires extensive collecting, naming, standardising, collaborating and exploiting. Universal knowledge is also composite, but it tends not to show its seams.

The thesis-as-collection is an ongoing process, a process that in the form of a compilation thesis remains transparent. It is written within the field of History of Science, Technology and Environment, with strong influences from the Environmental Humanities, reflecting the thesis’ roots in the fields of literature, history of the book and museum studies. In particular, the thesis has grown out of a study of the early history of the Oxford University Botanic Garden in the seventeenth century, and an internship digitising nineteenth-century botanical correspondence at the RBG, Kew. It engages with a range of disciplines, which is reflected in the fields in which the papers have been published or will be submitted. This means that the audience for each individual paper is not the same as the audience for the articles reframed into a thesis through the kappa, although there may be overlap.

I. “Utopian Order and Rebellion in the Oxford Physick Garden.” This article draft looks back at the changing uses and perceptions of the Oxford University Botanic Garden (founded 1621) and its collections from the perspective of the portrayal of the Garden as a model of order in an early eighteenth-century poem in honour of the keeper, Jacob Bobart the Younger. It is written with an early modern studies audience in mind, intended for submission to the Renaissance Studies Journal.

II. “Between the Field, the Library and the Garden: Translating and Transplanting the Book of Nature in Seventeenth-Century Oxford.” This chapter in the forthcoming anthology Understanding Field Science Institutions (edited by

Helena Ekerholm, Karl Grandin, Christer Nordlund & Patience Schell) charts botanical collecting in seventeenth-century Oxford by tracing books and plants between the three collecting spaces of the field, the library and the garden. The primary audience is historians of science, particularly with an interest in the history of botany as a field science.

III. **“Real Treasure between the Pages’: An Enquiry into Pressed Plants in Books, and Why They Matter.”** This article draft argues for the value of pressed plants found in books and the importance of preserving and documenting them, demonstrating that this neglected resource is more widespread and possible to interpret than is reflected in the scholarship. It is written for the *Journal of the History of Collecting* and has the widest audience of the papers in this thesis, of relevance to those interested in material culture and literature, cultural historians, historians of botany and of the book, as well as conservators, librarians and archivists.

IV. **“Global Plants and Digital Letters: Epistemological Implications of Digitising the Directors’ Correspondence at the Royal Botanic Gardens, Kew.”** *Environmental Humanities*, vol. 6, 2015, pp. 73–102. This published article analyses the digitisation of a botanical correspondence collection available on the Global Plants database as a longer process of selections that began with the writing of the letters in the nineteenth century. Although published in the context of the Environmental Humanities, it is equally of relevance to the digital humanities and historians of botany.
Collecting Plants

This thesis begins with early modern Europe, particularly seventeenth-century England. That is not to suggest that botanical collecting emerged out of the blue at this time and place. The quadripartite garden itself has a rich earlier history in medieval monastic gardens as well as Islamic garden traditions such as the Mughal char bagh, “microcosms of spatial order”.9 Using plants for medicine and dye, for instance, required the ability to correctly identify and find the relevant species. One of the great stimuli for collecting plants, writing about them and cultivating them was a turn to ancient Greek and Roman authorities. However, while the developments in early modern plant collecting can in many ways be seen as a continuation of earlier practices, there are significant changes. One of the most important is collecting plants as a global endeavour, reflecting the growing awareness of “the existence of a world flora” through increasingly widespread commercial and colonial networks.10 Richard Grove argues that the new botanic gardens presented “landscape ‘texts’” that through their global reach “signified a particular type of ecological control that had not previously been available.”11 The power of conceptualising the global was combined with a Baconian insistence on experience, an empirical study of (in this case) plants that was only possible through the linked practices of travelling and collecting. As Peter Dear puts it, “A European science that would encompass the world needed to

10 Grove, Green Imperialism, 75. For the importance of natural history collections for universal taxonomy, see Peter Robert Dear, Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500–1700 (Basingstoke: Palgrave, 2001), 129.
11 Grove, Green Imperialism, 75.
bring that world home.”\textsuperscript{12} This involved translation, deracination, whether a figurative or literal uprooting, and transplantation. However, collecting plants was no easy task, and collectors experimented with different ways of fixing, preserving, transporting, cultivating and representing plants. The invention of the printing press and proliferation of the book played an essential role in efforts to manage the subsequent chaos, but in the process also fed the exponential growth in botanical collecting that followed.

As botany has become increasingly standardised, institutionalised, professionalised and specialised, the criteria for relevance have changed with each generation of botanists. At the same time, there are basic practices such as collecting, mounting and labelling specimens and studying them in search of an ordering system for the kingdom of plants that have remained a constant. This is particularly true of the herbarium, which in the most basic sense of preserving plants by pressing, labelling and mounting them on paper continues to be used today. The underlying concern of botanical collecting is how to make plants knowable. This is an epistemological problem, but also an extremely pragmatic concern. The human-plant relationship has been, and continues to be, characterised by the role of plants as a central resource for human survival, used for food, medicine, fabric, dye, curiosity and ornament. The separation of economic botany and ethnobotany from the purely scientific study of plants is relatively recent, before which the systematic empirical study of plants was inextricably bound up with interests in their potential value or usefulness.\textsuperscript{13} Another constant is the challenges plants

\textsuperscript{12} Dear, \textit{Revolutionizing the Sciences}, 124.

\textsuperscript{13} For the professionalization of botany, see Jim Endersby, \textit{Imperial Nature: Joseph Hooker and the Practices of Victorian Science} (Chicago: University of Chicago Press, 2008). Even in nineteenth-century imperial collecting, the separation of scientific uses of the collection from, for instance, economic or aesthetic uses was in some sense a rhetorical struggle to demarcate it.
pose as notoriously slippery epistemological objects, particularly when it comes to classification. They germinate, bloom and decay according to the seasons; they adapt to new environments, they hybridise and evolve; they are overwhelmingly diverse. They are intimately rooted, and shaped by the conditions in which they grow: to move them requires transformations of space. In a local context, the diversity and mutability of plants are more manageable, enabling transplantation and acclimatisation, but with a larger scope, local plant taxonomies cannot account for the distribution of plants globally. This is the challenge created by travelling beyond the known in geographic terms, and by the introduction of plants from elsewhere, both of which contributed to the flood of new plants and plant names in early modern Europe.

At the same time, the materiality and life cycle of plants enable collection, transportation and preservation: seeds are designed to travel, whether with the help of human agency, other animals, or the elements; the diversity and adaptability of plants enables them to survive in new environments, such as a glasshouse; and many plants can be pressed and dried, in part or as a whole organism. This collecting is enabled by a range of disparate yet often intersecting group of tools and practices that have the same basic function: plants must be stabilised to be knowable, particularly out of the contexts in which they have grown. Plants are conserved through stabilising climate, most notably through glasshouses and freezing seeds (cryotechnology), which is linked to confined or controlled spaces (botanic gardens, Wardian cases, vasculums, herbaria, paper). Equally, the conservation of plants is enabled through stabilising and communicating information about plants using language (library, correspondence, travel writing, classification, illustration, glass and wax models, lists, databases).\textsuperscript{14} Herbaria combine

\textsuperscript{14} The Wardian case is a small greenhouse-like container which creates a terrarium or microclimate in which living plants can be
material and textual technologies, in ways that have remained constant, even though there of course have been changes and reconceptualizations along the way. This is true even when the process of standardisation has brought about changes, notably from pre-Linnaean bound or book herbaria to loose sheets that can be reorganised and enable much larger collections.  

With the development of new technologies, the viability, transportation and taxonomy of botanical collecting have altered considerably since the early modern period, yet plants continue to pose many of the same challenges.

The logic of conservation or preservation which has generated much botanical collecting continues to inform the use and continual expansion of botanical collecting. There is an underlying tension in seeking to preserve living things; drawn to its extreme, we kill what we seek to conserve. The herbarium can protect a pressed plant specimen from change (and ideally also from insects and mould), fixing it in time, but this requires a removal from its original state of growth. At least for smaller species, pressing the plant in order to preserve it involves killing the plant.  

The nature reserve or garden can protect a plant species from predators, particularly humans, but limits genetic exchange, influencing how the species develops and potentially impoverishing the gene pool.  

transported. Introduced by Nathaniel Bagshaw Ward in the nineteenth century, it revolutionised the problem of plants dying on ships with limited access to fresh water and botanical expertise (although there were many similar solutions to transporting live plants before Ward). The vasculum is a portable container to keep plants in while out collecting.

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16 This is also true of taxidermy, but unlike pressing plants, taxidermy involves only using the skin of the animal—herbaria specimens are contained, taxidermy specimens become containers.
17 See, for instance, Thom van Dooren on Hawaiian crows: Thom van Dooren, “Life at the Edge of Extinction: Spectral Crows,
Millennium Seed Bank, Paul Smith, argued at a symposium in Leiden on “Botanic Gardens in a Changing World” in April 2015, there is no remnant of the pristine wild; all we have is a technogarden.\textsuperscript{18} Human efforts to manipulate plants were an important component in the early modern histories of botanical collecting discussed in this thesis, even though Nature was constantly asserting herself in the face of culture, even in the confines of the garden walls. Today’s collecting is still urgently pursued with the aim to preserve or engineer, but in very different contexts, for instance as responses to extinction rates and debates about monoculture, GMO and deforestation. The inclusion of an endangered plant in the IUCN (International Union for Conservation of Nature) Red List of Threatened Species and botanical databases enables conservation efforts, but can also contribute to creating a kind of economy of the scarce. Seeds – the ultimate example of life (albeit dormant) contained in microcosm – are a special case, as they can be frozen and remain viable without inherently changing them. Used together, these confined spaces are powerful tools enabling plants to be transported, controlled, enjoyed, and known. They are exclusive spaces, operating according to a logic of boundaries, yet they can also be used to universalise.

**Utopia**

Utopia is a distinctly spatial category. The term itself, coined by More for his fictional travel account of the same name, is a play on

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\textsuperscript{18} See also Paul Smith et al., “Making the Case for Plant Diversity,” *Seed Science Research* 21, no. 1 (2011). In response to alarming rates of extinction, Smith and his co-authors, for the urgent need for “techno-gardening,” an interdisciplinary effort using botanical collections for in-situ and ex-situ conservation: “With the range of techniques available to us, there is no technological reason why any plant species should become extinct.” (p. 2).
words between “no place” and “good place,” and has become most widely associated with fictional accounts of idealised places, often with the assumption that they cannot be realised. However, the spatiality of utopia is equally relevant when thinking about actual spaces such as collections (textual and botanical) whose components have been removed from their context and put in a “no place” where they can be arranged. Confined and ordered spaces are central to handling the mutability of plants. The spatial removal is particularly transformative when it comes to collecting living plants on a global scale (rooted in place and changing according to the seasons and life cycles), whether through transplantation or propagation from seed in the botanic garden, or through drying and mounting plants as herbaria specimens. Confined collecting spaces were not only a practical necessity for preserving and ordering plant material, but were, like utopia, linked to the conceptual or actual construction of parts into a whole – the earth as globe, the state as the body politic of the monarch, and the world flora within the four garden walls. The image of the whole was associated with truth (unlike the plurality of error and falsehood), unity, harmony, health and peace.

Utopia and botanical collecting share a similar chronology, as both emerged in sixteenth-century Europe, beginning with Thomas More’s *Utopía* in 1516, and the first botanical gardens in Italy.¹⁹ Utopia and early botany were also shaped by many of the same broader historical contexts: the flood of wondrous tales and plants brought back from lands Europeans had never heard of, the rediscovery of classical Greek and Latin texts, the increase in textual production and spread after the invention of the printing press, and the search for order in the face of considerable religious

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¹⁹ Paula Findlen describes how the field collecting, botanic gardens and the first herbaria emerged in Italy around the same time as linked spaces and practices. Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley: University of California Press, 1994).
and political upheaval. By the seventeenth century, utopia had become an established genre, giving rise not only to utopian texts, but utopian projects which sought to realise their ideals through the reform of society and nature. Francis Bacon provided an influential focal point for these projects of reform in Salomon’s House, the utopian institution described in New Atlantis appended to Sylva Sylvarum: or A Natural History (1627). Later in the century, Salomon’s House, with its focus on experimentation, teaching and collecting, was explicitly used as a model for the Ashmolean Museum (founded in Oxford in 1683), and the Royal Society (1660) with strong links to Oxford. These utopian projects were in many cases driven by the Biblical models of Adam, Noah and Solomon, and a vision of Eden where plants and people thrived in perpetual spring, where everything had its true name enabling perfect communication, and harmony reigned.

Reforming knowledge required the reformation of language, reflected in the growth of lexicography as well as universal language projects, which in effect sought to create a new taxonomic system and nomenclature for language in its entirety. These intersected with early plant systematics and the search for a universal language of plants before the Linnaean system was widely adopted a century later. Language and communication are foregrounded in many early modern utopias, reflecting an interest in ancient languages from other parts of the world (notably Chinese, Hebrew and Egyptian hieroglyphics) and the possibility of collecting traces back through the fragmentation of Babel and the Fall to the perfect Edenic language. In practical terms, English was not standardised at the beginning of this period, and the vocabulary grew exponentially through loan-words in translations

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20 For another link between utopia, political structures and knowledge-making through the use of anamorphic art, see Stephen Greenblatt, Renaissance Self-Fashioning: From More to Shakespeare (Chicago: University of Chicago Press, 2005).
and neologisms spread through print. This was particularly evident of plant names, descriptive phrases that became ever longer, with fierce debate surrounding not only which name to use, but what taxonomic principle to use in the first place (flower, fruit, leaves). Language enabled order and control, which was crucial for medicinal and other uses, as well as for the growing global market of plants.

Another important facet of language in utopia is the use of plain or clear language, credibility and verisimilitude. This is at the heart of the joke of utopia, the “no-place” that More goes to great trouble to set up as a true account. He includes a letter addressed to his friend Peter Giles, who in the narrative is part of the dialogue, and emphasises the naturalness of the traveller Raphael Hythloday’s account of the island state of Utopia:

...I had no need at all to trouble my brains about the disposition or conveyance of the matter, and therefore had herein nothing else to do, but only to rehearse those things which you and I together heard Master Raphael tell and declare. ... And my writing, the nigher it should approach to his homely, plain, and simple speech, so much the nigher should it go to the truth, which is the only mark whereunto I do and ought to direct all my travail and study herein.

This was closely connected to the problem of how to test the veracity of others’ accounts, a concern shared by proponents of the experimental method. In Bacon’s *New Atlantis*, the members of Salomon’s House have divine abilities “to know thy works of creation, and the secrets of them; and to discern (as far as appertaineth to the generations of men) between divine miracles, works of nature, works of art, and impostures and illusions of all

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21 Ibid., 24.
sorts.” Studying the natural world was often described as an exploration of unknown worlds, particularly worlds opened up by technological innovations such as the microscope and the telescope. Botanical collections similarly brought the world into view, where it could be studied up close and truths encountered in books could be tested.

Early modern utopianism is useful for understanding botanical collections as models of order, spaces in which parts are assembled into a whole—real or imagined. This was explored in a range of collecting-spaces (the book, gallery, cabinet, mosaic, garden, theatre, the body, the state and so on) that could in themselves or metaphorically provide a vision of unity, of one-ness, even while demonstrating how that vision is constructed. Inversely, dissection and anatomising cut apart the whole and showed it to be made of many parts. As with the microscope and telescope, these spaces often self-consciously played with scale, particularly as microcosms which could scale up to encompass the nation or the globe. Margaret Cavendish’s utopia, The Description of a New World, Called the Blazing-World (1666), which like Bacon’s New Atlantis was published together with one of the author’s philosophical works, emphasises the need for an absolute monarch to turn unrest and factionism into unity and peace: “one Soveraign, one Religion, one Law and one Language.” As Noel Malcolm has argued, the title page of Hobbes’s Leviathan (see Paper II), in which the body of the sovereign is made up of a multitude of the small heads of his subjects, is a reference to a kind of anamorphic art or optical illusion in which a collection of painted heads observed through a tube with a cut lens creates a new head from parts of the others. This and other contemporary optical illusions

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23 Ibid., 160.
24 Margaret Cavendish, The description of a new world, called the blazing world, (London: Printed by A. Maxwell ..., 1668), 121.
25 Noel Malcolm, “The Titlepage of Leviathan, Seen in a Curious
Figure 1: An example of anamorphic art from Jean-François Nicéron’s *La perspective curieuse, ou magie artificielle des effets merveilleux* (Paris, 1638). Courtesy of the National Library of Sweden, 161 A 5 Fol.

involved seeing from two perspectives at once, an quality that in Stephen Greenblatt’s reading is shared by More’s *Utopia*. The tension of a fictional account that poses as real, and that mirrors the contemporary world in which it is written, is central to the use of utopias as satire. Utopias as a “good place” has particular relevance for the imaginative power of gardens as restorative retreats associated with a whole spectrum of positive attributes including abundance, health, harmony with the social and natural world, enjoyable labour, beauty, spiritual reflection and secluded love-making. In the European tradition, this has Biblical roots in the Garden of Eden, and classical roots in Arcadia. Many utopian texts feature gardens in an urban setting (in More’s *Utopia*, the dialogue through which the trip to Utopia is described takes place in a garden) or the paradise-like conditions of tropical islands. The utopian island repeatedly represents salvation—divine miraculous salvation, in the case of *New Atlantis* and *The Tempest*, from death at sea—but also the negative consequences of the island as a restricted and frightening space with limited resources.

It is this hint of excessive restriction that has become a dominating feature of later dystopian narratives in which absolute control creates a horror of the same and the individual is subsumed in the whole. Foucault highlights order as the defining characteristic of utopia, the oppressive side of which he elsewhere explores as enforced by and in turn strengthened by structures of power and

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26 In his analysis of the painting “The Ambassadors,” Greenblatt draws parallels between Hans Holbein’s “anamorphic virtuosity” and More’s *Utopia* as a serious joke. “Utopia presents two distinct worlds that occupy the same textual space while insisting upon the impossibility of their doing so.” Greenblatt, *Renaissance Self-Fashioning*, 22.


control through the examples of the mental asylum and the prison as panopticon. 29 Robert Burton’s utopia in *The Anatomy of Melancholy* (first published 1621, the same year as the Garden was founded) is expressly restrictive and confining as a remedial measure – if the loss of individual freedom can produce peace and unity (a healthy society, as it were), it is worth the cost. The same tension of control and order as life-giving and life-stifling is found in the history of botanical collecting. In the early modern period, the lack of a common taxonomy and nomenclature created an unmanageable chaos of names, plants and conflicting ordering systems that had serious consequences for the exchange and use of plants, particularly for medicine. However, greater control over the centuries has been a mixed blessing. While there are still undiscovered species, plants have become known and possible to manipulate from the gene to the ecosystem. With increasingly industrialised and standardised agricultural production, a monocrop plantation can be controlled to the degree of being genetically homogeneous, maximising yields distributed on a global market to create that utopian ideal of abundance through comparatively little human labour. 30 At the same time, anxieties about limits to growth on a global scale reflect the restrictions of

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29 Foucault takes order to express the *episteme* or underlying thought structure of the early modern period. In particular, he describes utopian order as a single coherent language enabling communication and understanding, as opposed to a heterotopia where communication breaks down. Somewhat confusingly, he elsewhere (“Of Other Spaces,” from a lecture given in 1967) describes the garden as one of a number of *heterotopias*, combining an ideal order with a material space, while a botanic garden could also be called a utopia using his first definition. Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (London: Tavistock/Routledge, 1989).

30 Ian Scoones has analysed national and transnational mobilization against genetically modified seeds in the context of a wider debate about “the future of agrarian society.” Ian Scoones, “Mobilizing against GM Crops in India, South Africa and Brazil,” *Journal of Agrarian Change* 8, no. 2–3 (2008).
the earth itself as an island in uninhabitable space.\textsuperscript{31} Concern about diversity loss is driving the use of botanical collections for conservation and re-wilding projects. Within a growing environmental movement, it is labour-intensive small-scale local agricultural production that has become idealised.

Utopia is also, and urgently, about time. Of the twentieth-century engagements with utopia and its derivatives, Michel Foucault’s coining of \textit{heterochrony} to describe the cemetery as a space in which many different times coexist with the present. As cumulative spaces of preservation or conservation, heterochrony is useful in accounting for the anachronism of the accumulation of plants and papers from different times in the same collection. This element of time and the change, decay, death and regrowth that go with it, are what give the garden a special link with utopianism, setting it apart from most other object-based collecting. A recent article by Stephen Forbes argues that botanic gardens as living collections must be understood as inherently shaped by continuity and flux, with particular focus on the Orto Botanico in Padua.

While implicit in our relationship with plants and within the living collections of botanic gardens, the fugacious nature of the living collection is rarely addressed. The perception of botanic gardens as an institutionalized collection, which implies an attempt to “fix” its objects in time and place, is undone by the fact that plants are living things.\textsuperscript{32}

The title of the issue of \textit{Studies in the History of Gardens & Designed Landscapes} in which Forbes’ paper was published—“Out of Time: Temporality in Landscape History”—reflects the need for further enquiry into the temporality of botanical collecting. Writing in the context of architectural utopias, Laurent Châtel

\textsuperscript{31} Donella H. Meadows et al., \textit{The Limits to Growth} (London: Earth Island, 1972).

\textsuperscript{32} Forbes, “Collections and Knowledge,” 245.
singles out the tension between continuity and change in the garden as a particularly utopian quality.\textsuperscript{33} This maps neatly on to Forbes’ analysis of the botanic garden, as well as matching the argument of this thesis, that utopia is a useful tool for writing non-teleological histories of botany:

There is a methodological gain to be had in maintaining a constant level of awareness of utopianism in the interpretation and experience of the garden for one is thus guarded off from a progressive history whereby one style supersedes or proves better than the other. Each century, each age, each decade ought to be credited with its own manifestation of ‘utopian thinking’ and thus the scholar looking for what is “new” or “better” need not be trapped in linguistic or chronological classification—rather, he is sent back to close observation of forms and typology with a greater sense of continuum.\textsuperscript{34}

Through confining and ordering, utopia operates in the tension between preservation and loss, between stasis and change.

This early modern utopian eclecticism (a genre, an ideal, projects of reform) makes it a useful tool for analysing botanical collections spanning classification, publications, herbaria and gardens, as expressions of the same underlying logic. Utopia is spatial, in that it confines and orders, and spacious, in that it accommodates for the variety of botanical collecting over time and space. Like botany, utopia has been continually reconceived and reimagined over the subsequent centuries. Most recently, versions such as cybertopia are a response to the utopian potential created by the new space of the digital and the Internet.\textsuperscript{35} Utopia is a deeply ironic form, self-

\textsuperscript{33} Laurent Châtel, “From Topiary to Utopia? Ending Teleology and Foregrounding Utopia in Garden History,” \textit{Cercles} 30 (2013).
\textsuperscript{34} Ibid, 99.
\textsuperscript{35} The usefulness of utopia for the analysis of collections and collecting
consciously constructing spaces that hover between the real and the imagined or ideal, appropriate to tensions (between preservation and change). Most importantly, perhaps, utopia links confined spaces with universal knowledge, through which universality is not so much a law ‘out there’ to be discovered, but a composite construct requiring the manipulation of people, plants and places. Thus utopia is much more than a theory in this thesis; the thesis itself is about utopia, and its common ground with botanical collecting.

**Networks: Continuity and change over space**

Scholarship on the history of botany covers a variety of subjects and themes: the collection itself, taking into account its materiality, organisation and wider significance; the process of collecting and the collecting networks through which the plants and knowledge about them circulated or failed to be transmitted; and the collectors who not only delimit the scope, but whose biography mirrors that of their collection.\(^3\) Perhaps the most influential theoretical model for accounting for the relationship between the networks and the centralised collections is Bruno Latour’s *centre of calculation*, describing the movement of things, people, and standardised information through networks, institutions can be seen in its application in the field of museum studies. Foucault’s categories are rather static, however. For more flexible categories, Gilles Deleuze and Félix Guattari’s concepts of smooth (heterogeneous) and striated (homogeneous) space are constantly in the process of becoming, so that a space can be either or both depending on how it is perceived. To borrow Michel de Certeau’s urban example, the city which looks striated from above becomes smooth when experienced via the multisensory perception of a pedestrian walking its streets. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (London: Bloomsbury Academic, 2013).\(^3\) For an example of the use of biography to structure the analysis of a collection, see Marie-Christine Skuncke, *Carl Peter Thunberg: Botanist and Physician: Career-Building across the Oceans in the Eighteenth Century* (Uppsala: Swedish Collegium for Advanced Study, 2014).
standardised and accumulated in collection centres such as botanic gardens.\textsuperscript{37} As with Actor-Network Theory more broadly, the network must be delimited to be manageable, for instance through focusing on a geographical area or the biography of a collector.

The rewards of tracing the mechanics of circulation in a botanical context are more clearly described in another Latourian model, the chain of reference. Latour uses the concept to describe how certain kinds of scientific knowledge are made, based on his field observations of an expedition of scientists to Boa Vista in the Amazon. One member of the expedition is a botanist, and Latour describes the practices involved in collecting and transporting plants, drying and ordering them in the herbarium, and finally in publishing the results. In his analysis, corresponding words and things are connected by a chain of reference which can be traced and retraced. In the case of botany, the herbarium refers back to the plants in the forest, the labels refer to the plants in the herbarium, and the publication refers back to the labels. The herbarium plays a key role in this process as one of many collecting containers or “empty forms” in the expedition which stabilise the specimens. “All these empty forms are set up \textit{behind} the phenomena, \textit{before} the phenomena manifest themselves, \textit{in order} for them to be manifested.”\textsuperscript{38} I refer to these empty forms as confined collecting spaces, but emphasise that the emptiness of these forms should not be mistaken for neutrality. They are constructed and maintained with effort, in a co-production of the materiality of the collection and the ideal order produced from it: “the practical Platonism that turns dust into an Idea via the two


callused hands firmly holding a notebook/instrument/calibrator.” Although the world of Boa Vista in the late twentieth century is far removed from early modern Europe, the concept is useful for tracing how knowledge is produced through botanical collecting.

For most of the period covered in this thesis, however, particularly preceding the professionalization and institutionalisation of botany as a separate field with its own resources by the twentieth century, the collecting and study of plants was conducted within other networks. Writing of Jesuits and the Dutch East India Company, Peter Dear highlights “the close relationship between administrative networks and scientific networks, which possessed their own capacities for generating global, integrated knowledge.” This has been explored in numerous studies for instance of knowledge production in cosmopolitan urban centres, and of the role of trade networks such as the respective Dutch and British East India Company.40

While the centre of calculation model has been widely referenced as an accurate description of the mechanics of botanical networks, it has been criticised for its failure to account for exclusions and power inequalities, with the risk of inadvertently reinforcing them. Kapil Raj and others have shifted the focus to indigenous knowledges which has been marginalised or ignored as peripheral

39 Ibid., 60. In general, caution should be used when applying STS concepts to interpret early modern material, as STS has emerged in response to a science that has reached a hegemonic dominance in contrast to its early modern roots.
to a Eurocentric account. From Raj’s perspective, the focus is on what is transmitted as much as what mutates or is lost in the network, which Londa Schiebinger combines with a gender perspective in her study of the suppression of knowledge of the abortive properties of the peacock flower. A useful source for the study of plant circulation (or failed circulation) is botanical correspondence, as letter writing was an essential conduit for such exchanges. Jim Endersby’s study of Sir Joseph Dalton Hooker’s role in establishing the Royal Botanical Gardens at Kew is a good example of how a nuanced analysis of botanical correspondence can yield a multifaceted and human history of empire. Correspondence can also reconstruct histories of botanical collecting outside of Europe, as in Anna Winterbottom’s “Medicine and Botany in the Making of Madras, 1680–1720” in *The East India Company and the Natural World*. Winterbottom focuses on collecting and spaces of experimentation in Madras, showing that they were not simply replicas of European models, but hybrids shaped also by local medical practices and Moghul gardening traditions.

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While network perspectives have come a long way in decentralising the history of botany, it is important not to focus exclusively on networks and circulation, as much remains to be investigating concerning the power and functions of collecting spaces. In *Putting Science in its Place*, David Livingstone argues: “It is critically important to pay attention to those sites that have generated learning and then wielded it in different ways. At every scale, knowledge, space, and power are tightly interwoven.”45 He uses space rather than chronology as the organising principle, which suggests that space can accommodate history-writing as spaces are “neither static nor stable; they are mobile and mutable.”46 This is certainly true of botanical institutions such as the botanic garden, which enabled the preservation of botanical collections beyond the life and fortunes of their collector. Emma Spary’s analysis of the Jardin du Roi in Paris surviving the upheavals of the French Revolution reveals how inextricably debates about ‘natural’ order were implicated and used as arguments for political order.47 Another fruitful approach has been to focus on moments of institutional change or the reorganisation of a collection, as in Jenny Beckman’s spatial analysis of the Natural History Museum in Stockholm.48 The institutionalisation of the scientific study of plants was closely connected to standardisation processes. There have been studies on the role of ‘paper technologies’ for the organisation and standardisation of these networks, notably in relation to Linnaeus, which is a useful approach for understanding inter-

46 Ibid., 8.
referencing practices between different collections (such as the herbarium, the garden and the catalogue).49

The institutionalisation of the collection and study of plants retained a reliance on social networks built on the exchange of plants and information about plants, forming communities of knowledge. Collecting plants involved collecting people, particularly on a large scale. This included not only fellow plant specialists, but a wide range of travellers (missionaries, military, tourists etc.), some of whom pursued plant collecting as a form of social capital. In historical studies, the agents in these networks or the members of these communities tend to be centred on humans and human technologies, although some also take into account the resistance of plants to participation.50 There are, for instance, many references to plants dying en route or herbaria sheets moulding. A range of fields such as critical plant studies, feminist epistemologies, and multispecies ethnography are reconfiguring networks in terms of entanglements, relationality and care. Such entanglements are more difficult to approach retrospectively, as the plants themselves which cannot speak cannot be observed either (with the possible exception of the herbarium).


50 Orchids are an extreme case. Before the mystery of how to propagate them from seed was solved, local orchid populations were exhausted by orchid hunters in response to escalating demand, but most did not survive the journey. See Jim Endersby, Orchid: A Cultural History, (Chicago: University of Chicago Press, 2016).
Anachronism: continuity and change over time

Botanical collections are anachronistic in several senses, taken out of time as well as out of space. On the level of the individual plant, herbaria specimens are created by preserving the plants after removing them from their seasonal and daily cycles of growth, and in some cases manipulating the time of germination, flowering and giving fruit in living collections. On the level of the collection, the choice of what to include and how it is preserved and documented shapes the ways in which later generations use it. Forbes’ suggestion that the temporality of the botanic garden’s living collections has not sufficiently been taken into account holds true for botanical collections more widely. He argues that herbaria function like object-based collections, as they become fixed objects.51 This relationship between the living and the dried is key to a historiography of botanical collecting. Precedence for connecting the early modern and the present in the history of collecting can be found in studies such as Ken Arnold’s study of the ‘tussle between continuity and discontinuity’ in museum practice, and Ann Blair’s introductory remarks about the similar states of ‘information overload’ triggered in particular by the printing press and digital technologies.52

However, the herbarium is in some important respects not like other object-based collections: the materiality of the pressed plant allowing it to be widely transported, incorporated into the library with its paper technologies and treated as a form of visualisation while remaining a source for empirical study. Also, the herbarium is in itself an unusual collection in that it expresses multiple temporalities. Each herbarium sheet reflects the historical

52 For museums, see, Ken Arnold, Cabinets for the Curious: Looking Back at Early English Museums (Aldershot: Ashgate, 2006). For information overload, see Ann Blair, Too Much to Know: Managing Scholarly Information before the Modern Age (New Haven: Yale University Press, 2010).
moment of its collection, and often several later instances of annotation, remounting and or rearranging. In order to understand the name on the specimen label, the taxonomist must consult botanical publications cotemporary with the collection of the plant. Type specimens (the specimen from which a species was first described) operate on a logic of tracing origins, creating common stable points of reference, at least in theory. In this sense, taxonomy is a deeply historicising science. At the same time, scientific best practice and the conceptualisation of species and how they should be understood and named has been constantly contested and renegotiated, often reflected in the accumulation of notes made generations of botanists. Thus the scientific use of herbaria today is in some ways a continuation of earlier practices, while also part of a very different paradigm. In this sense, the herbarium is inherently anachronistic in removing plants from their life cycles, and in creating a collection space which is in some sense removed from the changes in how and why the empirical study of plants has been pursued. Once dried, there is surprisingly little difference in how old herbarium specimens from ten years ago and three centuries ago look.

These temporal shifts can be seen in two articles on the history of botanical collecting by Stephen Harris, who combines the botanical and historical perspectives. When explaining the role of herbarium specimens in one case, and the role of standardising nomenclature in another, he is dealing with ongoing practices and shifts from the past to the present tense. In the former, Harris and his co-authors are discussing William Dampier’s collecting practices in the late seventeenth-century:

Herbarium specimens – the gold standard of botanical documentation – provide physical evidence for the occurrence of a species at a particular point in time and space. Specimens avoid the problems involved in translating written records of vernacular names – or interpreting poorly executed images – in
order to establish scientific names through time and across cultures. The preparation of good plant specimens in the field is a simple process, but it requires attention to detail.53

And again, when it comes to naming:

Names are flags conferring identity and enabling information about the natural world to be acquired, ordered, stored and transmitted in time and space. Names may also be used to assert possession or denote an individual’s status. In the pre-Linnaean era, formal names for natural history objects were usually phrase names (polynomials). However, independent of whether a name is a polynomial, modern binomial or even vernacular name, for maximum use a name should be (1) applied unambiguously and (2) mean the same thing to all users. The correct application of names therefore has direct scientific, economic and social consequences.54

A few historians have attempted longer histories of herbaria, such as Alexandra Cook in relation to her study of Jean-Jacques Rousseau’s botany. Cook analyses the herbarium as a boundary object, and Fleischer analyses it as a centre of calculation.55 When focusing on continuities of practice and materiality, Science and

Technology Studies models can be useful to analyse how the collections functioned. However, because the field of STS emerged as a response to the hegemony of a standardised and institutionalised twentieth-century science, care is needed not to treat early modern collecting as if it shared these qualities.56

Diachronic histories of botanical collecting raise vexing questions of definition, particularly concerning the herbarium. There are practices and collections, such as pressing and labelling plants for the purposes of empirical comparative study, which present the same basic solution to the problem of knowing plants from the sixteenth century to the present. In this sense, they can be called ‘botanical’ with the recognition that botany as a science did not exist in the sixteenth century, and that when ‘botanical’ began to be more widely used to designate the study of plants in the seventeenth century, this did not necessarily mean what it does now. What is more difficult is the question of what is not relevant to the history of botany. Actors’ categories can be used in an effort to understand a period in its own terms, but these categories have often excluded other actors’ knowledge claims, for instance in the struggle to raise the status of botany to a science in the mid- to late-nineteenth century, and the social hierarchies of male-dominated Eurocentric publication. Collections are created to be preserved, often at great effort and expense, so using them as possible sources is necessarily engaging with the interests, values and structures of the context in which they were produced. At the same time, how they can be known is shaped by choices made by later generations of owners and professionals such as librarians and archivists, whether from continued use, restricted access or neglect. In this sense, the collection is an ongoing process.

56 For instance, Bruno Latour’s account of botanical collecting as a chain of reference is an explicit departure from the chain of being and the world of correspondences in which these very collecting practices began in the sixteenth century. Latour, “Circulating Reference.”
A useful tool for analysing the collection as a process is “object biographies”, a concept borrowed from material culture, anthropology and related fields. As Chris Gosden and Yvonne Marshall explain, “Not only do objects change through their existence, but they often have the capability of accumulating histories, so that the present significance of an object derives from the persons and events to which it is connected.”

Even a herbarium sheet collected and mounted by a professional botanist to be incorporated in to the herbarium of a botanical institution is not free from the accumulation of other histories and meanings. This is particularly pertinent to collecting in colonial settings (see Article IV). When applied to plants, as living organisms rather than objects, the concept of “biography” takes a more literal meaning. Jim Endersby’s recent study of orchid-people relations from the ancient Greeks to the present, Orchid: A cultural history, demonstrates how fruitful following changing conceptions of a particular species or family can be. He draws on a wide range of sources including science fiction and cinema as well as botanical publications to argue that the history of the scientific understanding of orchids cannot be separated from fiction, myth, gender, class, trade and religion. By focusing on a single family, it becomes clear that the history of the scientific study of orchids is shaped by these cultural contexts as well as by and entangled with the specific characteristics of orchids, such as their morphology, reproduction and captivating beauty. (A history of tulips, for instance, might instead focus on the importance of bulbs dormant in winter for transportation, trade and the Dutch “tulip mania” in the 1630s.) This history of a mutually

transformative relationship between plants and people again resembles an object biography approach.\textsuperscript{59}

Finally, preservation of collections is a future-oriented act, reflecting a belief that they will be valuable for future generations of users. In the present moment, the importance of botanical collections for the future reflects urgent concerns about species extinction, the destruction of ecosystems and a deeper anxiety about future loss. This is seen in the use of herbaria specimens in rewilding projects, and perhaps most clearly in global seed preservation projects, notably the Svalbard Seed Vault and Millennium Seed Bank, saving plant diversity for the future on the DNA level. Preserving these collections has become directly associated with preserving the world flora, reflecting an optimism in the saving possibilities of technology that has been boosted but also challenged by discourses surrounding the Anthropocene concept. John Allen’s experimental Biosphere II project in the 1990s was a clear expression of turning to a microcosmic collection of plants for salvation, enabling survival in space, against the threat of a future earth rendered uninhabitable by climate change and pollution.\textsuperscript{60} Such a scenario is the basis for the earlier science fiction film Silent Running (1972), in which humans are the final threat to the natural world, leaving a robot to tend the last vestiges of the vegetable kingdom.

\textsuperscript{59} “The central idea is that, as people and objects gather time, movement and change, they are constantly transformed, and these transformations of person and object are tied up with each other.” Gosden and Marshall, “Cultural Biography,” 169.

Sources: “an incredible chaos of empirical material”

In so far as this thesis brings together botanical collections beginning with the early modern period, it is a return to the long chronological scope of the historiography of, for instance, Julius von Sachs at the end of the nineteenth century. However, here the similarities end, particularly as regards the choice and interpretation of sources. Writing as a professor of botany when it had only recently achieved scientific status, von Sachs’s account is clearly internalist:

...I have made it my chief object to discover the first dawning of scientific ideas and to follow them as they developed into comprehensive theories, for in this lies, to my mind, the true history of a science. But the task of the historian of Botany, as thus conceived, is a very difficult one, for it is only with great labour that he succeeds in picking the real thread of scientific thought out of an incredible chaos of empirical material.61

The “first dawning of scientific ideas” referred to in von Sachs’s intellectual history of botany and the early collecting practices which form the basis of this thesis are two perspectives on the same historical shift in the study of plants.62 As Sachs points out, establishing what is relevant to a history of botany is no easy task. In response to this challenge, he prioritizes the progression of scientific ideas. However, as this thesis argues, “the real thread of scientific thought” cannot be separated from the chaotic tangle of people, networks, ideas, books and plants. This picking of threads reflects the central question of how to define a botanical collection in the first place, a question that is explored in different ways in

62 For an account of the epistemological shifts during the seventeenth century and in what regards the contested “Scientific Revolution” can be applied, see Dear, *Revolutionizing the Sciences.*
each of the papers in the thesis, following the search for botanical order as embedded in rather than separable from the “incredible chaos of empirical material”.

The choice of sources used to tell histories of botanical collections and related practices determines whose knowledge is legitimated. For instance, botanical publications are central to tracing debates about taxonomic systems and the identification and naming of new species, yet as this was largely a male domain (with the exception of illustration), it follows in von Sachs’s account that “the true heroes of our story” are men, and men who publish.63 The role of women has changed over the centuries, but as many studies of women and botany have shown, they were by no means absent. However, their roles tended to be more domestic than public, and their involvement in botanical publications was mostly limited to illustration.64

By focusing on European collection spaces, there is a risk of interpreting the essential role of collectors as peripheral, particularly obscuring the importance of indigenous knowledges within colonial networks. However, administrative archives can be used to yield traces of everyday exchanges or reliance on local collectors (even if they are not named), and pinpoint moments when indigenous or other local knowledge is either suppressed or appropriated without acknowledgement. The Directors’ Correspondence Collection, which is discussed in the fourth

article, is a rich resource for the diversity of participants in Kew’s vast global botanical network, particularly as it only contains letters written to the Director of Kew. The annotation of the letters by previous generations of Kew staff, as well as the botany-oriented design of the Global Plants database on which the digitised letters are uploaded, reflect an extractive approach to this resource that resembles von Sachs’s isolation of the “thread of scientific thought”. The scientific framing of these collections can have important implications for how they can be used for different readings of the history of botany. For instance, approaching the DC letters through the digitisation process gave a fuller and richer grasp of the letters than finding and accessing them on the Global Plants database, which proved to be a painstaking and occasionally unsuccessful undertaking.

This thesis is based on a range of printed sources as well as different kinds of botanical collections, which I describe in more detail below. The printed sources include herbals and garden catalogues, utopian texts, and poetry, as well as some manuscript sources. Many of the printed sources from botanical collections have been heavily annotated, blurring the distinction between manuscript and print, the unique object and the reproduced text. This is particularly key to the discussion of pressed plants in books as a form of marginalia (the subject of article III), between examples of correspondence between the plant and where it is pressed, and the book simply being used as a container whose materiality is particularly well suited to pressing and preserving plants. This involves a different way of “reading” the books which ignores the text and instead homes in on the margins and the gutter. There is an element of training the eye involved, as I have become better at finding and more confident at interpreting plant-like stains in books. Article three explores these plants as a rich resource which have received little scholarly attention, in part because unlike plants in a herbarium they are in a sense out of place, scattered like a shadow archive in books preserved on the
whole for their textual content. This secondary status within other collections makes them less visible (they are often not documented in the metadata), and in some cases they have been destroyed altogether.

The collections included within a botanic garden as an institution vary considerably, from just the garden as a collection of living plants, to also including a herbarium, seed collections, a library, archives, plant models made for pedagogical purposes and economic botany collections. Each botanical collection is unique and must be approached as such, but collections can nevertheless be categorised according to how they approach the challenge of collecting plants. The garden, the herbarium, books and the database are the main kinds of collections discussed in the thesis—mostly English but including some collections from other parts of Europe, particularly Sweden. I approach the herbarium as an artefact that offers a very simple yet efficient and extraordinarily long-lived solution to the problem of preserving, collecting and studying plants. From this perspective, the question of what material is relevant to the history of the herbarium does not necessarily correspond with a botanist’s distinction between a scientific herbarium and other collections of pressed plants.

In the first article, the use of poetry and utopian texts as a lens through which to study the early history of the Oxford Garden is a response to the richness of the collections but also to the scarcity of the surviving archives. The second and third articles particularly engage with books as containers for plant collecting, which involves a different approach to “reading” botanical publications. Pressed plants found in early modern printed books present a particularly interesting case, as unlike herbaria specimens there is often little metadata to suggest who put the plants there and why. This is the topic of the third article. The fourth and final article also explores issues connected to
metadata, the relationship between plants and text and the implications of different ways of accessing source material (whether plants or text) through the digitisation process and through a botanical database.

**The Garden**

Using gardens as historical sources of botanical collecting presents an obvious obstacle: because plants are living organisms, the garden must be continually planted and replanted. The Linnaeus Garden in Uppsala illustrates this well. Although it has been replanted in the same order as it was under Linnaeus, fixing the garden at a particular point in its history, the plants available now are not biologically the same as the ones available to him. Like the university botanic gardens in Padua and Leiden, the architectural space provides the historian with a better understanding of the garden as a collecting space in terms of size, layout, visibility and accessibility from the street, and so on. The Oxford University Botanic Garden is still dominated by the sturdy stone walls and gate, and retains the basic quadripartite layout, but does not replicate historical planting beyond a historical border with significant seventeenth-century species. Given the longevity of some trees, they can in some rare cases provide continuity on the species level that spans centuries. A striking example of this is a yew tree in the Oxford Garden that was planted by Jacob Bobart in 1645 during the civil wars, and is still standing. However, in the last decades the yew has changed sex and begun to produce pollen, possibly in response to changes in climate. Thus the historical specificity of the plants is shaped by changes in the natural as well as the socio-cultural environment. Not only do the individual plants mutate, but the garden itself is

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65 A number of early modern botanic gardens have been moved from their original locations (for instance Cambridge, Edinburgh, Uppsala, Leuven, Stockholm), often because of competition for space in growing cities, and in part because of problems with flooding. A spatial analysis of a related move is found in Beckman, *Naturens palats*. 
constantly being replanted and reordered. Historic buildings that remain do so through active restoration.

Framing is important for the interpretation of living collections in a botanic garden as the exhibition or display of labelled specimens is in competition with the expectations and aesthetics of a park or pleasure garden. A good illustrative example is the difference between a visit to the living forest gallery in the Melbourne Museum, which is enfolded by the museum building itself, and the landscape garden aesthetics of the Melbourne Botanic Garden. The tension between the garden as a public versus a scientific space is an old one, and what the public has access to continues to be shaped by the multiple roles of a botanic garden to provide pleasure, teaching, research and, increasingly, retail.

I have spent the most time in the Oxford University Botanic Garden, but have visited as many others as I have been able to.66 This includes gardens founded before the eighteenth century (Padua, Florence, Leiden, Amsterdam, Paris, Uppsala, the Chelsea Physic Garden, Edinburgh) and after (Gothenburg, Lund, Bergianska in Stockholm, Fredriksdal in Helsingborg, Copenhagen, Vienna, Leuven, Rome, Zagreb, Bucharest, Göttingen, Glasgow, Kew, Cambridge, Chiang Mai, Chicago, New York, Sydney, Canberra, Melbourne, and Cranbourne).

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66 Very few early archives survive for this garden. Early twentieth-century histories of the garden and herbaria collect most of this material, such as Robert Theodore Gunther, *Oxford Gardens* (Oxford: Parker and Son, 1912); and Sydney Howard Vines and George Claridge Druce, *An Account of the Morisonian Herbarium...* (Oxford: Clarendon Press, 1914). No history of the Garden has been attempted since until Stephen Harris’s recent historical overview: *Oxford Botanic Garden and Arboretum: A Brief History* (Oxford: Bodleian Library, 2017). Correspondence offers a rare glimpse, but is not held in Oxford but scattered through different collections. Jacob Bobart the Younger’s correspondence reveals an actively fostered network in which not only letters but seeds and plants were exchanged.
**Figure 2:** View of the Oxford University Garden from the Danby Gate (April, 2015). Photo by author.

**Figure 3:** The oldest tree in the Oxford University Botanic Garden, a yew tree planted during the Civil War in 1645. Photo by author.
The Herbarium:

The most distinctive features of the herbarium as a botanical collection are that the plants are dried (pressed) and therefore in a relatively fixed form, and that they are incorporated into a world of text and paper, whether in book or unbound form. The materiality of plants makes this possible, in contrast to many other kinds of natural history collections, including most zoological collections. Fossils are not mutable, but they are heavy and cumbersome. Fish are notoriously difficult to preserve, although some examples of “fish herbaria” are known (and fish glue was commonly used to mount plant specimens in a herbarium). Collections of pressed insects come the closest to herbaria; there are examples of a pressed butterfly floating suspended above a mounted specimen on a herbarium sheet, and I have often come across squashed insects when looking for pressed plants between the pages of library books. In their material form, herbaria have more affinity with the library than with the natural history museum. Pressed plants enable huge collections that are global in scope, with specimens still being sent between herbaria all over the world. Historically, this is in part thanks to the relatively cheap and accessible process involved in pressing plants, enabling the widespread participation of plant-enthusiasts, including those with limited resources.

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68 For the importance of the materiality of plants for pressing and exchanging them by post (unlike unwieldy, heavy and fragile anatomical specimens), see Margócsy, Commercial Visions, 33.

69 Anne Secord demonstrates the central role of the book as collecting space for amateur botanical collecting. Anne Secord, “Pressed into Service: Specimens, Space, and Seeing in Botanical Practice,” in Geographies of Nineteenth-Century Science, ed. David N. Livingstone
The most important specimens in herbaria collections dating back to Linnaeus are the type specimens, which are key to providing a point of reference for the first description of each known species. These are often the first to be digitised, and lend a degree of stability in practical terms even given the fluidity of the species as a concept in an evolutionary framework. Herbaria collections often also include collections of plants and parts of plants that cannot be pressed, such as wet collections. These are fragile, relatively expensive, highly flammable and require regular topping up with alcohol.

The historiography of the herbarium has pivoted on the unbinding of the herbarium particularly associated with Linnaeus and his cabinets with moveable shelves in the first half of the eighteenth century. In the sixteenth and seventeenth centuries, collecting and mounting pressed plants in books became sufficiently common for such objects to be widely recognised and produced, if within limited circles. At the same time, their diverse size, arrangement, quality and organisation reflect the range of uses for which they were made, including as an apothecary’s reference book, a pedagogical tool, an aesthetic collection, and what would now be considered a botanical collection, often linked to published works on classification. Bound herbaria continued to be produced into the twentieth century, but were increasingly marginalised after the unbound herbarium enabled ever-larger standardised institutional collections, global in scope. As the discussion on the history of herbaria in Article III argues, however, this should not simply be read as a development from constrained and fixed (bound) to global and limitless (unbound) collections.

The main herbaria consulted in the course of this thesis are the Oxford University Herbaria (Department of Plant Sciences at Oxford University), but I have also consulted herbaria in the


Figure 4: Göttingen University Herbarium cabinets. Photo by author; published with permission from the Göttingen University Herbarium.

Figure 5: Boxes from the Pharmacognostic Collection of Goettingen University. Photo by author; published with permission.
Figure 6: Shelves from Carl Peter Thunberg’s herbarium in the botany collections of the Museum of Evolution, Uppsala. Photo by author; published with permission from the Botany Department at the Museum of Evolution, Uppsala.
Figure 7: Wet specimen from the Herbarium of Goettingen University. Photo by author, published with permission.
The book/botanical libraries:

The library or book may not at first be considered a botanical collection, but access to botanical publications has been crucial particularly to taxonomists. Botanical libraries are a rich resource which reflects the interests and points of reference of individual botanists, but also the degree to which botanical works were in publication. The Bergius Library in Stockholm is particularly interesting as a collection, as the Bergius brothers stipulated in their will that no books be removed or unbound, preserving the library as it was in the late eighteenth century. The catalogue of Jacob Bobart the Younger’s library, drawn up in 1719 after his death, is proof of his botanical credentials. Other botanical libraries I have consulted are at the botanical department in Florence and the Cory Library in Cambridge. Most of the other libraries I have consulted, particularly in search of pressed plants for Article III, have been in Oxford (Bodleian libraries, particularly the Sherardian Library, and college libraries), elsewhere in England (a number of college libraries in Cambridge, the Lindley Library, the Worshipful Company of Barbers, the Royal College of Physicians, the British Library) and elsewhere in Europe (the Bernadotte Library at the Royal Palace in Stockholm and the Leiden University Library).

Figure 8: Plant pressed between pages x–xi of John Evelyn’s *A Parallel of the Antient Architecture with the Modern* (London, 1723) in Malthus C.7.10, Old Library, Jesus College, Cambridge. Published by permission of the Master and Fellows of Jesus College, Cambridge.
The database (and social media):

The database is in some ways the perfect utopian collecting space, capable of holding a seemingly endless amount of information with multi-layered ordering systems. The main database as botanical collecting space discussed in the thesis is the Global Plants database (launched 2013), the subject of Article IV. The usual spatial and material constraints appear to be blown away in the virtual collecting space. Translated into a digital image, herbaria sheets, economic botany objects, publications, correspondence, photographs, illustrations and a social platform can all be brought together, reconnecting collections that were often sent to Kew together (for instance, a letter accompanying the dispatch of a Wardian case). As many of Kew's collections come from other parts of the world, particularly former colonies, this digitisation is a way to make the collections more accessible in the regions to which the species represented are endemic and from where they were collected. There is also a conservation argument for making digital images of the herbaria available, to reduce wear and tear, although increased visibility could also create increased demand to see the originals.

While the database removes boundaries between collections that separate material that was historically entangled, it introduces a new kind of boundary: the boundary between the virtual and the material. By increasing accessibility to that which is digitised, there is a risk that material that is not digitised becomes less visible and accessible. Digitisation and datamining tools enable new research questions and the possibility of gathering information from datasets on a previously unimaginable scale, but this cannot replace close reading, and the degree of technological mediation makes source-criticism increasingly challenging. This was clear in the difference between reading and summarising letters from the Directors’ Correspondence as part of the digitisation during an internship in early 2012, and trying
to find and access the letters later through the Global Plants database. The difficulty in using the database as a historian is in part because the search functions are designed for botanical specimens rather than correspondence, illustrating how important it is to consider what kind of knowledge a collection is intended to enable.

Social media platforms, including blogs, have been valuable resources in this thesis in providing transparency for and sharing knowledge gained through the digitisation process, and in spreading images of pressed plants in books that are often not included in the metadata.

**Other sources:**

One category that is not discussed at length in the thesis is botanical illustration, although it is included in relation to the herbarium and pressed plants more generally as a form of visualisation. Botanical illustrations could also be analysed as composite or ideal images, but are not so discussed here. Glass and wax models of plants are a fascinating material that has played an important pedagogical role in teaching botany, enabling the close-up study of flowers as three-dimensional objects rather than enlargement through the two-dimensional view of a microscope. An important category of botanical collections is economic botany or ethnobotany collections, which contain a wide range of objects made from plants, from baskets to medicine. They reflect a clear distinction between collecting and forming plant material for scientific purposes, notably herbaria, and other ways of using plants.

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70 For instance, for a discussion of the species as an ideal “archetype” in the eighteenth century, see Lorraine Daston and Peter Galison, “Truth-to-Nature,” chap. 2 in *Objectivity* (New York: Zone, 2010). “The type was truer to nature – and therefore more real – than any actual specimen.” (p. 60)
Because historians, like taxonomists, traditionally rely on the written word, finding ways to tell other stories involves exploring other sources, or other ways of reading sources. I have followed botanical collections as processes of selection and ordering according to different parameters, including owners’ or practitioners’ priorities and expectations, the intended use, the materiality of objects, and the spaces and technologies available to preserve and order them. For collections that have been preserved over many generations, this requires being attentive not only to the actors’ categories and the wider context in which the collection was started, but to any subsequent reordering, redefining and new justifications for the collections’ continued preservation. These concerns and how they shape the use of botanical collections as sources are central to Article III and Article IV. Article I explores how botanical collections were defined and redefined by different actors over the first hundred years of the Oxford University Botanic Garden’s history, and Article II focuses on the many uses and meanings of books in the collection and study of plants across the spaces of the field, the library and the garden.

**Structure: The thesis as collection, patchwork and garden**

The compilation thesis – a collection of articles with an extended introduction or *kappa* – is becoming an increasingly acceptable, if debated, alternative to the monograph in Swedish history departments. The choice of form has several significant implications. Most obviously, the structure and process are very different. Even if a compilation thesis were to tell a single story, each article would still respond to the particular pressures of the journal chosen, making a single narrative thread more or less impossible. Also, importantly, the compilation thesis does not raise the reader’s expectation of a single thread. Thus the finished thesis to a greater or lesser extent retains traces of the process involved, interweaving structure and methodology. Writing the thesis as a
collection rather than a single narrative (though of course there are many ways to write a monograph) also has deeper theoretical implications, as it can result in a combination of separately applied theories that do not necessarily cohere. While this allows for objects of study that straddle several fields or disciplines – a valuable quality for research into the history of botany, which has been approached from so many different disciplinary traditions – combining theoretical frameworks can make it difficult to maintain analytical depth due to the spatial constraints of each article. This is particularly the case as there are as yet no fixed standards for a compilation thesis in the humanities. At the same time, the openness of this genre allows for experimentation with the relationship between form and content, an area which is well suited to the humanities in general and literary studies in particular.

In this case, the choice of compilation thesis is a deliberate structuring device. It is a methodological response to the challenge of addressing continuity and change over a long period of time, as the articles can provide a loose chronology without creating a linear teleological progression. As a collection of articles participating in conversations preceding and extending beyond the final text of the thesis, the possibility of multiple arrangements opens up a space for thematic connections between the articles that cut across their chronology. The thesis, in a sense, becomes a space in which to curate a collection. In this case, it is about and in itself an exploration into questions concerning selection and delimitation, continuities and change, and the spatial arrangement of ideas and objects. This reflects the dual role of author and curator of the articles.

There are different ways of conceptualising how the parts form a whole in the thesis as a collection space. Patchwork has provided a useful conceptual framework throughout the process of writing,
selecting and assembling this thesis. The focus is on the production of space: although patchwork quilts can be highly ordered and geometric, they are traditionally pieced together out of scraps of fabric made for another context, working outwards rather than shaped by the constraints of the loom when weaving. There is precedent for using patchwork as both structure and method for a compilation thesis: *Patchworking Publics-in-the-Making: Design, Media and Public Engagement*, by Kristina Lindström and Åsa Ståhl in the fields of interaction design and media and communication studies.

We argue that one of the strengths of *patchworking* is that it opens up to work with both parts, relations between them and a whole at the same time. *Patchworking* can take the shape of an entity while at the same time recognising that it consists of parts – the seams are both separations and alignments.

They are influenced by multispecies ethnographers’ use of textile metaphors, “*patchworking* intervenes in and troubles linear, singular storytelling and dualisms. It suggests narratives with several entry- and exit-points.” The compilation thesis as a space with multiple points of access maps on to the layout of the Botanic Garden, which is discussed further below.

*Patchworking Publics-in-the-Making* is however a very different kind of thesis from the historical study presented here. Lindström and Ståhl’s use of *patchworking* reflects a commitment to the co-production of knowledge emerging from a discrete set of public

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71 Deleuze and Guattari use textiles as metaphors to explain the differences between smooth (heterogeneous) and striated (homogeneous) space, giving “patchwork” as an example of the former. Deleuze and Guattari, *A Thousand Plateaus*.


73 Ibid, 102.
engagement projects which are analysed in the five articles or “patches” published in different contexts. The historical nature of the present thesis, however, introduces an element of chronological restraint, and although there is some overlap of material between the first two articles, on the whole the four articles present four discrete studies based to a greater or lesser extent on different sources. The suitability of patchwork as a figure for describing the process of assembling this thesis is rather in the prior creation of individual “blocks”, in this case squares, which are then assembled by adding strips and borders to sew the blocks into a whole piece, finished off with a binding. This is the role of the kappa (literally a cloak or enclosing fabric).

Collection metaphors such as patchwork can be useful in considering the strength and weaknesses of composite texts, in this case the heterogeneity of the compilation thesis. The influential Swiss sixteenth-century physician Paracelsus used the figure of the beggar’s patchworked cloak to criticise herbals that were global in scope and compiled from multiple texts written in different places and at different times, instead of adhering to direct experience of local plants.74 Too much heterogeneity in a thesis, particularly on the level of theory, could call into question the coherence of the whole. In contrast, Nicéron’s anamorphic art described above playfully allows the collection and the perception of the ordered whole to coexist. From this perspective, the kappa in this thesis provides the lens of utopia through which the botanical collecting discussed in the articles is brought together. Similarly, the botanic garden as a microcosm made of microclimates provides an analogy for the role of the individual papers in this thesis in including different disciplinary perspectives. Early modern gardeners were acutely aware of the challenges and rewards of transplanting species into their

gardens, but this was only possible by creating microclimates within the garden. As Virgil stated, and Robert Sharrock quoted (see Articles I p.21 and II p.36), “all Grounds can’t all things bear”. The articles in this thesis are in a sense microclimates, pursuing concerns related to discussions and audiences which are more specific than those addressed by the thesis as a whole, ultimately enabling a greater diversity of perspectives.

The arranging and rearranging of the four blocks in this thesis has not been completely random. Indeed, some kind of structural restraint to work against was necessary to make the potentially endless scope of the thesis manageable. Early on in this project, similarities emerged between the compilation thesis, the ordered space of the Oxford University Botanic Garden and overriding questions about delimitation and order. The pattern for the patchwork has from the outset been that of the quadripartite garden enclosed by walls. This space is produced in the opposite order to the patchwork, beginning with the walls and the quadrants, followed by the ongoing process of planting, pruning, weeding and replanting. As with the unruly and unpredictable growth of plants, there is need for a formal structure as a response against the unruliness of textual production, that constantly outgrows its bounds, must be alternately coaxed and trimmed, pruned, etc., particularly given the wide scope in temporal terms and in terms of content. Some ideas pursued within the scope of the thesis didn’t take and were removed, while others have had to be carefully cut back so they do not take over. The thesis, as it stands, is the result of working from both directions, with the garden providing necessary constraint and a pattern with which to work, while patchwork reflects the fluidity of arranging and rearranging the topics available within the disciplinary training, skills and sources available.
I. Utopian Order and Rebellion in the Oxford Physick Garden

II. Between the Field, the Library and the Garden: Translating and Transplanting the Book of Nature in Seventeenth-Century Oxford

III. “Real treasure between the pages”: An Enquiry into Pressed Plants in Books, and Why They Matter

IV. Global Plants and Digital Letters: Epistemological Implications of Digitising the Directors’ Correspondence at the Royal Botanic Gardens, Kew

V. Epilogue
The Oxford University Botanic Garden provides the pattern for this thesis. This garden is the point from which the thesis as a whole has grown, enclosing its chronological scope and its focus on confined collecting spaces. Founded in 1621 following the example of continental gardens the previous century, it is the oldest botanic garden in England and the oldest scientific institution in Oxford. The Garden is a (nearly) square structure of four quadrants and a central fountain (although the fountain is a later addition, a point to which I shall return later), dominated by the walls that enclose it. Four gates (three originally, with a fourth added later) provide access through imposing walls. Four was a significant number: four continents, four seasons, four humours, four points on the compass, four winds, and the four sides of a square.
Using the garden as not only content but form gestures towards the playful experimentation with the textual space of the book in the early modern period. A poem or a book could present itself as a garden, a gallery, a painting, a cabinet, a house, a porch, a theatre, a wreath or coronet, a globe, and so on. A number of botanic garden catalogues include maps of the garden, some with corresponding empty boxes for students to fill in the plants growing in each section. A curious example of the division of a book into quadrants (featuring the four winds), here introducing an element of jest, is found at the end of George Wither’s *A Collection of Emblemes...* (1635), where the combined use of a spinning wheel and the four books in the collection points to a particular emblem – a horoscope, in effect. It offers another way of navigating the book than reading it from cover to cover.

*Figure 11*: George Wither’s *A Collection of Emblemes...* (1635). Courtesy of Pennsylvania State University.
The Botanic Garden, with its four quadrants arranged symmetrically around a central point, could also be seen as a collection of five by forming a quincunx (like the five dots on the face of a die), a pattern that the physician Thomas Browne explored in *The Garden of Cyrus* (1658). He collected examples of this pattern described in text and observed in nature, from the structure of the stem of a plant and the arrangement of leaves, to the architecture of the ancients, to the spiritual realm. The quincunx or latticed network which it forms is not only a spatial feature, but a functional device optimising spatial arrangement to enable strength, circulation, access to the sun, etc. This reflected a belief in the underlying providential order in creation, an order that was mathematical and legible. Browne mimicked the quincunx in the structure of the text, with five chapters of which the third and middle chapter is the longest.75

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The centre is a vexed point in the history of botany. Appropriately, this fifth point is something of a mystery in the early years of the Oxford Garden: the current fountain is a nineteenth-century addition, and there is no surviving evidence to back up the suggestion that there was originally a sundial there. It is clearly marked in Loggan’s map above, but absent from the Garden in his map of the city of Oxford. It is from this point that the Professor of Botany Robert Morison gave botanical lectures, and in *Vertumnus*, Bobart is described as “amidst his Plants and Trees;/ Full in the Centre, there he stands,/ Encircled with his verdant Bands”. Rather than add a central article to the thesis, the fifth point is held by an explanation of the cover of the thesis as an epilogue. As the cover is a patchwork of fabric dyed with plant material through participating in workshops and the natural dyeing community more widely, it explores knowledge of plants mediated through textile production rather than the world of paper.

**Paper summaries**

The four articles are summarised below, along with a note on publication or intended audience and chronology. As a patchworked thesis, the separate pieces are not only held together by the walls/border/kappa, but by common themes which create symmetries and which run like quilting threads between them. These threads are listed for each article or chapter. On the whole, the articles are in chronological order, from the early modern period to the present. However, the individual articles each engage with the collection-as-process in ways that disrupt a linear chronology.

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76 Thanks to Stephen Harris for pointing out this discrepancy in the maps. 77 Abel Evans, *Vertumnus: An Epistle to Mr. Jacob Bobart, Botany Professor to the University of Oxford and Keeper of the Physick-Garden* (Oxford, 1713).
Figure 13: Diagram illustrating the different chronologies of the four papers. Paper I begins with a poem written at the beginning of the eighteenth century, and uses it to look back onto the first hundred years or so of the Oxford University Botanic Garden. Paper II is about botanical collecting in seventeenth-century Oxford, but it is framed by a predominantly nineteenth-century oriented discussion about field science institutions. Paper III concerns pressed plants in books and how they are handled in libraries today, so that the paper both concerns current conservation and cataloguing practice and the history of pressed plants in books from the early modern period on onwards – a history whose chronology is uncertain at best. Finally, Paper IV analyses the digitisation of a correspondence collection as part of a longer process that began with the writing of the letters in the nineteenth century.
I. Utopian Order and Rebellion in the Oxford Physick Garden

**Threads:** Utopia, the Oxford Physick Garden, models of order, metaphor, early modern collecting, preservation, the relationship between plants and text.

**Summary:** In 1713, Abel Evans published *Vertumnus*, a poem both honouring Jacob Bobart the Younger, the Keeper of the Oxford Physick Garden (later the Botanic Garden), and upholding him as the model monarch of the utopian kingdom of plants. The poem conflates the realms of political and natural order, particularly in terms of right rule, liberty and restraint, simultaneously commenting on current political affairs and celebrating the Garden, its history and its gardener. This paper takes *Vertumnus* as a point of departure to analyse the Physick Garden as a place of order, with a focus on the Garden’s collections and collecting spaces: the geometric proportion of the built structures, the alphabetical order of the catalogues, and the use of the collections for experimentation and classification. The garden as an ordered space intersects with utopian currents in the period, particularly through Francis Bacon’s influential model institution, Salomon’s House, and universal language projects which sought to reform language and knowledge to resemble that spoken by Adam and Eve in the Garden of Eden before the fall. In portraying Bobart as a model monarch, Evans is simultaneously engaging with political iconography concerning ideal kingship at the end of the Stuart dynasty, and praising the aging Bobart in terms that mix poetic convention with historical detail of the Garden and its collections. The political and utopian facets of the Garden as a confined and ordered collection reflect widespread philosophical, theological, linguistic, poetic and botanical debates about order, particularly in terms of constraint and the relationship between the parts and the whole.
This article engages explicitly with botanical collections as they intersect with contemporary utopian ideas and practices. It begins by looking at the garden as a built space, an architectural feature in the urban landscape that was dominated by the solid walls and celebrated Danby Gate, forming a confined collecting space that was replicated in the four hedged and geometrically ordered quadrants. I suggest that the Garden came to be seen by some as a royalist monument through the Civil Wars and the following turbulence that was still being felt when Abel Evans wrote *Vertumnus*. The architecture of the Garden also had practical uses for cultivating, ordering and protecting the living collections within its walls. Here we see Bobart as a model monarch over his vegetable subjects, reflected in the large scope of his collections, his skill with exotic plants, and the (for the most part) obedience of the plants in responding to his care. Although no plans for the spatial arrangement of the planting in the garden survive, the catalogues from 1648 and 1658 and the three surviving herbaria reflect what was grown and to some extent how that changed, reflecting different concerns and uses (the ecological or geographic, the medical, the nursery or market value, experimentation and classification). In order to cultivate plants from different ecosystems and different parts of the world, the garden became a mosaic of microclimates replicating the growing conditions of the plants in the wild. There was a fascination with the variety and mutability of plants, even while this posed serious challenges to the running of the garden. In *Vertumnus*, Evans describes Bobart’s *hortus siccus* as a cemetery for the rebellious subjects that die despite his care, but are given a place in his dried collection. This is one of three book herbaria associated with the Bobarts, and intersects with a very particular strain of early modern utopianism, universal language projects, which the article discusses in relation to the animosity between two prominent botanists with whom Bobart worked, John Ray and Robert Morison. John Ray contributed the botanical tables to the most prominent of a number of universal language
projects, in this case by John Wilkins, and was frustrated by the constraints of Wilkins’s system which he found too narrow for the overwhelming diversity of plants. The project was linked to a belief in the possibility of a universal, fixed language contributing to social harmony.

It is this vision of a unifying order that would bring the parts (words, subjects, plants) into a harmonious whole that was behind depictions of the body politic of the sovereign constituted by his subjects. The garden was an ideal model of this social order because vegetable as well as human subjects are mutable and frail, but also responsive to cultivation. Given Evans’ conservative political views, a restraining monarch and church was necessary for peace at home and abroad to be possible. The garden as an explicitly royalist model of order brought together the gardener-physician’s medicinal knowledge of plants with the distinctly Stuart idea of the monarch as physician charged with healing diseases of state such as civil war. Evans’ depiction of Bobart and the Physick Garden must be understood within a critical moment in early eighteenth-century politics, but it nonetheless maps on to changing historical perceptions of the garden in the previous century. To some extent the scientific ordering is more closely connected to the least public collections – the hortus siccus and to a lesser degree the living collections in the garden – while the more overtly political associations are with the architecture of the garden, particularly the Danby Gate. However, it is very difficult to say what how Bobart viewed his own practices, for instance whether he shared Ray’s theologically inspired approach. In any case, Evans’ poem brings together different ways in which the different collections in the garden respond to transience and disorder by confining and ordering.

**Chronology:** The article uses *Vertumnus* as a lens through which to look back on the first century of the Physick Garden’s history, in
relation to other sources and perspectives. Although framed by the perspective of the early eighteenth century, the main concern of the article is how the Garden was reinterpreted as seen from the outside, and how the focus of the practices within shifted during the seventeenth century, even given the continuity of the first two Keepers.

**Audience/publication context:** This paper is written with the Renaissance Studies Journal in mind, with an audience interested in the early modern. The paper reflects the eclecticism of early modern studies, which commonly follow the interests of actors as they move between what would today be categorised as different disciplines (science, art, literature, politics, philosophy, theology, and so on).

**II. Between the Field, the Library and the Garden: Translating and Transplanting the Book of Nature in Seventeenth-Century Oxford**

**Threads:** The botanic garden, the Oxford Physick Garden, field science institutions, early modern collecting, preservation, the book of nature, the relationship between plants and text.

**Summary:** Although botany as a field science is associated with the nineteenth century, the practices of field collecting and empirical observation which underpin it are much older. This chapter explores the role of the book in the empirical study of plants in seventeenth-century Oxford, with a focus on three key spaces: the field, the library and the garden, specifically the University Physick Garden (founded 1621). Books were brought into the field as containers and reference books, and were themselves collecting spaces from which knowledge about plants could be gathered. Plants were brought into the library, where they were incorporated into the scholarly world and its paper technologies, for instance as bound book herbaria. In the Garden,
knowledge gained from reading in the library could be tested empirically by experimenting with living plants. In the numbered, geometric beds, the book of nature was presented as inherently ordered and rendered potentially legible. These spaces did not operate in isolation, but overlapped and were interlinked as plants and knowledge about plants circulated between them. The book was central to the empirical study of plants through collecting, ordering and experimenting, underpinned by processes of translation and transplantation.

This article offers another perspective on botanical collecting in seventeenth-century Oxford, and the ordering of different interconnected collecting spaces including the garden and the herbarium/library. There is some inevitable overlap, but where Article I focuses on the Physic Garden in particular, Article II looks at collecting in and around Oxford more widely, by tracing the circulation of plants between the three overlapping spaces of the field, the library and the garden (particularly the Physic Garden). Most of the chapter focuses more on collecting practices and the role these three spaces had. The field and library are explored using a range of sources from collections across Oxford, including contemporary accounts and books that contain traces of early collecting, such as notes and plant imprints. The section on the garden focuses on Robert Sharrock’s *History of the Propagation and Improvement of Vegetables*... (1660) as a study of the cultivation of plants that begins in the library and is tested in the garden. Sharrock is staunchly empiricist, yet his epistemology of the study of plants emphasising the alignment between form and function, is rooted in his belief in nature as an expression of divine wisdom and providence. This section is a more detailed analysis of the discussion on cultivation in the previous article, particularly as Sharrock argued against Epicureanism, and some of his references are to observations made in the Physick Garden by the Bobarts. However, in this paper the Physick Garden is just one place among many in which plants were collected, ordered and observed.
As a university town, Oxford brought together a concentration of books, gardens, collections, a printing press (one of three in England at the time) and like-minded enquirers into the natural world. In many ways, the drive to study living plants in fields and gardens began in the library. Books provided accounts to be tested and species to be identified; books could act as collecting containers in which plants could be brought home and preserved; and books were essential tools for keeping track of discoveries whether in the field (as in a flora) or in the garden (as in a catalogue). The metaphor of the book of nature permeates these overlaps.

**Chronology:** It is the most synchronic of the papers in this thesis in terms of content, with its focus on movement between collections, particularly in spatial terms. The diachronic perspective is in the writing of the paper as a response to a primarily nineteenth-century discussion about field science institutions. In the chronology of the writing of the thesis, this was the second to be completed, and as such was influenced by ideas and sources being explored in the first and third articles.

**Audience/publication context:** This is a chapter in a forthcoming anthology on “Understanding Field Science Institutions.” Given the focus on field science, the intended audience is primarily historians of science. Initially, the audience for this paper was the participants of a workshop with the same title as the anthology which it gave rise to. Unlike when publishing in a journal, I knew roughly what the rest of the book would be about beforehand. This had a direct impact on the paper I submitted: the paper I presented at the workshop was a diachronic study of the multiple meanings and values of the herbarium over time, which I reworked to focus on the early modern context to be more in line with the case study format of the other contributions. In the context of a collection of predominantly nineteenth-century
studies, the paper and the rewritten chapter sought to historicise the tension between the field and the herbarium in the nineteenth century and demonstrate that in order to understand the institutionalisation of botany as a field science it is necessary to begin long before the nineteenth century.

This article demonstrates most clearly the importance of the role of reframing in the compilation thesis, given the difference between reading it alongside studies of mostly nineteenth-century field science institutions and reading it as another perspective on botanical collecting in early modern Oxford alongside Article I, and as one of the contexts in which plants were pressed in books explored in Article III. The study could also be framed within an urban ecology conversation, as an early example of botanical collecting in an urban context. These early references have been used by later botanists to compare with their contemporary plant populations, including a recent conservation report for the Chilsey Woods area.78

III. “Real treasure between the pages”: An Enquiry into Pressed Plants in Books, and Why They Matter

Threads: Pressed plants, the history of the herbarium, metadata, book conservation, social media.

Summary:
Plants pressed in books are relatively common, but are a neglected historical resource. At least since the fifteenth century but particularly from the seventeenth, people have been pressing plants in books for all sorts of reasons, in all sorts of books. These pressed plants are difficult to find, and they are difficult to

interpret. Who placed them there, when and why? Whether pressed books can be found and how they are encountered depends on the expectations and decisions of the librarians, cataloguers, conservators and other gatekeepers. However, as their existence is not always known or documented, studying pressed plants in books other than bound herbaria (whether in print or manuscript) requires a collaborative approach, in this case building on conversations and social media platforms (Facebook, e-mail, Instagram, Twitter and blogs) as well as searches based on informed guesses which became better with experience.

This paper emerged from the accidental discovery of pressed plants in the early modern printed botanical books I was reading when researching the first two articles. What at first appeared to be a random case gradually grew into a research interest in its own right, as the occurrence of pressed plants in early modern books appears to reflect a widespread practice and to follow certain patterns. This is important to take into account for an understanding of how the herbarium emerged and why it took the form it did, as it becomes difficult to draw a line between the *hortus siccus* or book herbarium and other instances of pressed plants in books. The article begins by considering the book herbarium as a collection that is the primary purpose or content of the book, but also how this emerged not as a fixed and stable collecting space but as a collecting process linked to the flexibility of early modern reading practices. Also, book herbaria are useful to understanding other occurrences of pressed plants in books by illustrating the diversity of materials and purposes involved. This diversity is matched by the different kinds of books in which I have found or know of pressed plants so far. The main body of the paper goes through examples of pressed plants in books according to genre, including a range of botanical (herbals, garden catalogues, and floras), travel, devotional and literary genres. The full list this analysis draws upon is appended in a table of over 70 volumes. By using a comparative approach focusing on where pressed plants
are found, certain patterns emerge making it possible to draw some conclusions even without knowing the provenance of the book. In doing so, the distinction between botanical and other examples is primarily relevant in terms of genre rather than intent. In all of the genres included in the study, the significance of the pressed plants lies in the way they act as markers of time and place. When properly labelled, this allows them to act as botanical specimens, a stable referent, but can also hold a powerful sense of nostalgia, poignancy and intimacy as reminders of transience and mortality as well as people and events. The capacity of plants to evoke place is clear in examples related to travel, such as the Alpine tour.

For pressed plants in books to be used as source material, they must be preserved and made visible in the metadata. Finding and interpreting the plants is not possible without including the interventions of, in some cases, centuries of readers, owners, librarians and conservators. The books containing pressed plants in this paper come from a range of libraries, varying in size, resources and specialisation, which is reflected in the different ways the plants have been handled. To some extent each case is different, depending for instance on how rare or worn the book is. Ultimately, the decision rests on individual librarians and conservators, who hold differing views of best practice linked to whether the plants and other paraphernalia found in the book are considered to be foreign and a threat to the preservation of the book, or whether they are considered to be integral to the hybrid object the book has become. Many interventions involve removing the plants and storing them along with the relevant documentation in Melinex (plastic) or tissue, while others leave the plants in the book, perhaps restricting access. In some cases plants are discarded without documentation, but this is more difficult to trace, particularly for past interventions. On the whole, pressed plants are becoming more visible through the increasing use of online catalogues with expanded updatable metadata, as well as
librarians, conservators and others posting such finds on social media platforms (blogs, Instagram, Twitter and Facebook). However, as yet pressed plants are not always mentioned in the metadata, and even if they are the lack of standardised nomenclature within and between institutions can make them difficult to find.

Most of the examples discussed in this paper would not formally be considered a collection, although larger numbers of plants with labels in a single book do form collections, some of which moreover bear considerable similarities with contemporary herbaria. This intermediate space offers a view of botanical collecting from below, as it were, from the gutters, margins, stains and fragments. Equally, some conservation interventions remove the plant to effectively form a new collection outside the covers of the book, although inter-referenced and stored together. In bringing together all the examples I have found or read about, the table appended to the article creates a new collection: material in a collection is more likely to be preserved and used.

**Chronology:** This paper has the most open chronology, reflecting difficulties around establishing the provenance and dating of the plants which it discusses. Most of the books containing pressed plants discussed in the paper were printed in the early modern period, yet whether and in what ways the plants can be accessed is entirely dependent on how the books and the plants have been handled not only today, but in the intervening centuries. It was the last of the papers to be written, builds on ideas from the other three papers and emerged out of the process of researching paper I and paper II, particularly paper II.

**Audience/publication context:** This paper was written with the Oxford Journal of Collections in mind, but could also address a history of science audience.
IV. Global Plants and Digital Letters: Epistemological Implications of Digitising the Directors’ Correspondence at the Royal Botanic Gardens, Kew

**Threads:** Digitisation, the archive, conservation, the database as virtual ordered space, the relationship between plants and text, deracination, collection as process.

**Summary (abstract):** Digitisation is presenting new possibilities and challenges for the use of collections in the humanities as well as the sciences. However, digitisation is also another layer in a longer process of selections shaping the collection—something which must be analysed on a case-by-case basis. This paper considers the epistemological implications of the digitisation of the Directors’ Correspondence (DC) collection (1841-1928) at the Royal Botanic Gardens, Kew, made available through the Global Plants database. In order to avoid a polarised analysis of the end-products of archive and database, the selection process shaping this collection is traced from the writing of the letters and their reception into the DC at RBG, Kew, to the digitisation with corresponding metadata and the end-user searching the database. Particular attention is given to the digitisation process and the knowledge produced by the project digitisers, as they combine close reading and database searches in writing the summaries of the letters for the metadata. This analysis of the DC engages with wider discussions about digitisation by emphasising the importance of taking a longer historical perspective, with particular attention to moments of selection, and highlighting the knowledge generated by those involved in the digitisation process. By doing so, the result is not a clear trajectory but a combination of losses and gains, disconnections and reconnections. Care is therefore needed to avoid replicating the invisible losses of extractive approaches to knowledge production, particularly in the context of collection-based biodiversity conservation.
Global Plants is a botanical database digitising and bringing together material from a wide range of botanical collections from all over the world, including herbaria, publications, images, correspondence and economic botany collections. It is provided by JSTOR and is the largest of its kind. In early 2012, I contributed to this database on a very small scale during a three-week internship at the Royal Botanic Garden, Kew summarising letters for the metadata of the Directors’ Correspondence Collection as it was being digitised. Reflecting over and building on this experience, this article argues that digitisation must be understood as part of a longer process of selections beginning with the formation of the collection, in this case the writing of the letters in the Directors’ Correspondence collection. This is particularly important as the launching of the Global Plants database was discussed in terms of increasing access to colonial botanical collections as a form of “digital repatriation”. After considering the impact of digital technology on taxonomy and botany more widely, the article goes back to the nineteenth-century context in which most of the Directors’ Correspondence was written and collected, before analysing the digitisation process as a privileged form of access to the letters that combines close reading of large numbers of letters with database searches.

This article engages with the global botanical collection on two fronts: the explicitly global scope of Kew’s collections under Joseph Dalton Hooker, who with Darwin believed that was essential to establishing universal scientific laws for botany, and the vision of the botanical database contributing to a global community of plant science through enabling access to botanical collections. The latter is in some ways a step towards redressing the exclusivity and centralisation of power in an imperial context, yet the material collections and the institutional frameworks that preserve them remain where they are. The article demonstrates how creating a universal order by collecting plants and
knowledge about plants from all over the world in London, and creating a database through digitising and combining different kinds of botanical collections both involve deracination, an extractive approach to knowledge-making in which it is seen to exist independent of context. At the same time, such a high-profile project to promote the use of herbaria is notable when many herbaria are falling into neglect or even being dismantled.79

The possibilities and limitations of metadata are a concern common to Articles III and IV. In the case of the pressed plants and the Directors’ Correspondence, inclusion in the metadata (whether in an online library catalogue or the summaries on the database) increases the visibility dramatically. In the case of pressed plants in books, their inclusion in the metadata is the most effective way of making them visible and available for research, so that the historian need not rely only on informed guesses and serendipitous finds. The lack of standardisation in the metadata can be an obstacle to finding the material, but the number of possible words used to described pressed plants is limited, and can be addressed by including synonyms in searches and cataloguing. In the case of the Directors’ Correspondence, the summaries of the letters make their contents searchable for the first time, yet the choices of what to include in the summary of longer letters and the vocabulary of the digitisers introduces a new boundary between the visible and the invisible. Metadata, and the gatekeepers that produce it, are not a footnote to the research process, but central to it.

**Chronology:** This article argues that the digitisation of herbaria and the botanical database cannot be understood in isolation as a new development facilitated through new technology, but as a longer process of selection (and exclusion) and preservation

beginning with the creation of the collection being digitised. It explores one collection – the Directors’ Correspondence – from the sending of the letters in the nineteenth century to their digitisation in the twenty-first.

In the writing of the thesis, it builds on research conducted for my Master’s dissertation and was the first to be completed. The Master's dissertation was a response to the heterogeneity of the Global Plants database – which I discussed in terms of heterotopia and utopia. The database itself reflected utopian/universalist aspirations, the promise of the digital no-place, or virtual space, designed for botanists though intended for a broader audience.

Audience/publication context: The article was published in the Environmental Humanities Journal, initially in response to a call for a joint special issue combining digital and environmental humanities that did not materialise. The original version engaged more directly with a digital humanities audience, traces of which can still be seen in the published version.

Concluding reflections

This thesis set out to gain a better understanding of how the central role of collections in the history of botany has shaped it as a science. How have different kinds of botanical collections responded to the problem of making the notoriously diverse and mutable kingdom of plants knowable and, in turn, controllable? Why is there such a striking continuity of practice as far back as the sixteenth century, particularly in making collections of pressed plants, and how can a historiography of botany account for it? These are big and broad questions, but they are important because botanical collections are powerful tools with significant global and environmental repercussions. In this thesis, utopia provides a framework through which to analyse how botanical collections function as collecting spaces that preserve and order through
confinement. It captures the tension between changeable life and preserved but life-less stasis – between control that nurtures and control and stifles.

This thesis, as a collecting space in which four articles are arranged, explores botanical collections from a utopian perspective, while being attentive to the role of collections as sources for the knowledge produced in the thesis. Article III demonstrates how the act of collecting pressed plants in books (whether in a table or catalogue or in a Melinex sleeve) is instrumental to rendering them knowable or even possible to find in the first place. Article IV demonstrates most clearly how the botanical collection is an ongoing process of selection and redefinition, even while continually being added to and used. Article II focuses on the interaction between different collecting spaces in seventeenth-century Oxford, and how central the book and library were to this overlapping collecting. Article I establishes the commonalities between utopia and botanical collecting in seventeenth-century Oxford, through which constraint, order and control were closely associated with survival. These are all local studies of collecting, but they contribute to an understanding of the history of global botany by exploring the construction of the whole from parts and the power to universalise, to scale up and project to global whole, a world flora.

What then is a botanical collection? What belongs in the centre of these histories of botanical collecting? By looking at continuities of collecting and related practices, particularly relating to the herbarium, the four articles making up the main body of this thesis follow the long tradition of the “book of nature” metaphor that was so ubiquitous in the early modern period. This is not to suggest that nothing has changed – botany has branched off and specialised over the period this thesis analyses, and taxonomy’s fortunes and status have shifted repeatedly – but a strand, it seems, has always been about plants and texts, about books, about
rendering the empirically experienced world legible. Even today, large institutional herbaria order their specimen sheets according to a book of plant taxonomy. The two-dimensionality of herbarium sheets makes them particularly well-suited to efficient digitisation. Whether in book-form, labels or metadata, text is still needed for the herbarium to be legible and accessible. The more direct reading of the DNA of each plant through gene sequencing is a more perfect form of legibility, when each plant speaks its nature, as it were. It is as though technological advances have finally perfected what seventeenth-century naturalists sought and confirmed their belief in the possibility of tools that could compensate for the limitations of human perception in order to see into the very essence of nature. The knowledge this presents is exclusive, requires expensive and specialised technology, and produces a “text” which is only legible to a select few. The plant itself disappears from view and is replaced by this new text. If a more scientific or “natural” system than previous ones, the introduction of this new botanical language is causing disruption and confusion for those who work with plants on a more applied level. With more detailed knowledge of plants has come an astonishing degree of control. Far from the potentially rebellious plants in Abel Evans’ Vertumnus, the possibility of knowing each plant on the genetic level has generated GMO monocrops in which the vegetable subjects, as it were, disappear in a homogeneous field of replicas. This knowledge is extremely productive, generating high yields and enabling correct identification and by extension safer consumption of plants. At the same time, plants are finding other ways to rebel, as demonstrated in widespread concerns about diversity loss and invasive species.

Scholars from several emerging fields are calling for alternative regimes of knowing plants which are embodied, relational and bring the plant back in focus beyond its usefulness to us. The power of plants as metaphor can be traced in literature across time and cultures, but recently the importance of plants in philosophical
thought has also been explored from the perspective of critical plant studies. Plants cannot be easily or fully known by us, but we have much to learn from them. The idea that plants can teach us something recalls the moralised world of seventeenth-century utopianism. Philosophers such as Deborah Bird Rose insist on human relations with other species and environments as a duty of care, an idea that has been taken up by multispecies ethnographers. “Writing is an act of witness; it is an effort not only to testify to the lives of others but to do so in ways that bring into our ken the entanglements that hold the lives of all of us within the skein of life.” The disembodied observer is replaced with the situated, entangled, relational participant. Many multispecies ethnographers repeatedly use textile metaphors such as the skein of life, entanglement, knots, webs, weaving, cat’s cradle and threads to describe this interconnectivity between species. Inversely, van Dooren refers to extinction as an ‘unravelling.’ These perspectives on knowing plants are not a study of the book of nature, in an expectation of legibility, but rather pick up on another metaphor that was widespread at least into the eighteenth century: the fabric of life.

There is a risk of falling into a dualism between approaching the world of plants as legible (and by extension controllable and within our power to preserve), and as a relational, embodied and inextricably entangled. Wisława Szymborska’s poem “Utopia” (1976) provides an eloquent vision of this dualism, in which utopia is a realm of certainty and proofs “where all becomes clear” but which is “uninhabited”, as everyone leaves it to “plunge, never to return, into the depths,/Into unfathomable life.” Early modern

80 See, for instance, Laist, Plants and Literature; and Michael Marder, The Philosopher’s Plant: An Intellectual Herbarium (New York: Columbia University Press, 2014).
81 Deborah Bird Rose, “Multispecies Knots of Ethical Time,” Environmental Philosophy 9, no. 1 (2012), 139.
utopia is useful because it holds the tension between ideal order and its unobtainability in creative tension. This need not render the world illegible, but resists deracinated knowledge.
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