Journal of British Studies 62 (October 2023): 1011–1042. doi:10.1017/jbr.2023.10

Empire and the Theology of Nature in the Cambridge Botanic Garden, 1760–1825

Edwin D. Rose

Abstract Founded in 1760, the Cambridge Botanic Garden was designed to serve the theological interests of the university by developing a collection of living plants from across the globe. Exploring the construction and layout of the garden, its global network, methods of managing information, and the accessibility of the collection during the professorship of Thomas Martyn between 1762 and 1825, this article casts new light on the motivations for founding and managing a botanic garden in Cambridge. It shows how communication structures adapted as the British Empire contracted in the Americas and expanded into Asia and the Pacific, classifying species in the physical garden later inventoried in a series of published catalogues. It suggests that growing interests in natural theology intertwined the university with the expanding British Empire, developing a collection designed to educate students in the influence of divine providence on the vegetable kingdom.

> Botany is not to be learnt in the closet; you must go forth into the garden or the fields, and there become familiar with Nature herself; with that beauty, order, regularity, and inexhaustible variety which is to be found in the structure of vegetables; and that wonderful fitness to its end, which we perceive in every work of Creation.
>
> —Thomas Martyn[1]

In 1828, John Stevens Henslow (1796–1861), fourth professor of botany at the University of Cambridge, distributed a pamphlet describing how the university's botanical collection "had been consigned to a damp cupboard, and . . . was

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[1] Thomas Martyn, preface to Jean-Jacques Rousseau, *Letters on the Elements of Botany* [. . .], trans. and ed. Thomas Martyn (London, 1785), xi.

found to have suffered considerably. Not half of the specimens were in a sufficiently perfect state to be worth retaining."[2] Others were more blunt in criticizing Henslow's predecessor, Thomas Martyn (1735–1825). The botanist and horticulturalist John Lindley described Martyn as "the gentleman who filled the same chair for so many years, without performing any other duty than that of collecting his pay."[3] This notion of negligence and decline relating to the Cambridge Botanic Garden and its administration has been continued in several historical studies of eighteenth-century Cambridge. It has been suggested that the university "did nothing to advance science either by teaching or by facilitating research,"[4] with botany and natural history being placed "at the periphery of Cambridge intellectual life" and leaving "no lasting impression on the university."[5]

In examining the motivations for founding a botanic garden in Cambridge in 1760, its global network, the practices used to manage information, and contribution to teaching, I move away from previous accounts that examine local Cambridgeshire collecting, university administration, notable students, and the dominance of Newtonian mathematics.[6] Interests in natural theology and a desire to explore the extent of God's creation inspired the foundation and development of a botanic garden in Cambridge.[7] Covering the period associated with Thomas Martyn's long professorship, from 1762 to 1825, I examine the practices used to manage a diverse botanical collection.

Cambridge's theological foundation encouraged a set of priorities very different from those of other British botanic gardens. Many, including the gardens administered by Oxford and Edinburgh universities, the Chelsea Physic Garden, and John Fothergill's private garden at Upton, functioned to instruct physicians and apothecaries in the medical virtues of plants.[8] Others, including Kew Gardens, became connected to notions of national and imperial improvement, stimulating agrarian, economic, and commercial advances.[9] Several botanic gardens in Europe developed

[2] John Stevens Henslow, "Botanical Museum," 25 March 1828, MS Add 10205/5, fol. 2 Cambridge University Library. (Hereafter this repository is abbreviated as CUL).

[3] John Lindley, "Martynia diandra," *Edwards's Botanical Register* 10, no. 2001 (1837): 2001.

[4] Charles Gillispie, *Genesis and Geology: A Study in the Relations of Scientific Thought, Natural Theology, and Social Opinion in Great Britain*, 2nd ed. (Cambridge, MA, 1996), 20.

[5] John Gascoigne, *Cambridge in the Age of Enlightenment: Science, Religion, and Politics from the Restoration to the French Revolution* (Cambridge, 1988), 287; see also Max Walters, *The Shaping of Cambridge Botany: A Short History of Whole-Plant Botany in Cambridge from the time of Ray into the Present Century* (Cambridge, 1981).

[6] Gascoigne, *Cambridge in the Age of Enlightenment*; John van Wyhe, *Charles Darwin in Cambridge: The Most Joyful Years* (London, 2014).

[7] For natural theology and gardens, see John Hedley Brooke, "Natural Theology," in *The History of Science and Religion in the Western Tradition*, ed. Gary B. Ferngren, Edward J. Larson, and Darrel W. Amundsen (New York, 2019), 58–64; Nulia C. Johnson, *Nature Displaced, Nature Displayed: Order and Beauty in Botanical Gardens* (London, 2011); John Prest, *The Garden of Eden: The Botanic Garden and the Re-creation of Paradise* (New Haven, 1981).

[8] Zachary Dorner, "From Chelsea to Savannah: Medicines and Mercantilism in the Atlantic World," *Journal of British Studies* 58, no. 1 (2019): 28–57, at 34; Clare Hickman, *The Doctor's Garden: Medicine, Science, and Horticulture in Britain* (New Haven, 2021).

[9] Richard Drayton, *Nature's Government: Science, Imperial Britain, and the "Improvement" of the World* (New Haven, 2000); John Gascoigne, *Science in the Service of Empire: Joseph Banks, the British State, and the Uses of Science in the Age of Revolution* (Cambridge, 1998), 130–31; Sarah Easterby-Smith, *Cultivating Commerce: Cultures of Botany in Britain and France, 1760–1815* (Cambridge, 2018), 2–14.

https://doi.org/10.1017/jbr.2023.10 Published online by Cambridge University Press

in relation to cameralist economic doctrine, among them Carl Linnaeus's Botanic Garden in Uppsala, designed to test his theory of floral acclimatization.[10] In Cambridge, the utility of plants remained a secondary focus to that of acquiring a diverse collection of living and dried plants to demonstrate divine creation. However, limited attention was devoted to performing experiments on plant specimens "in order to discover their Virtues, for the benefit of mankind."[11] Natural theology was instead the framework through which many Cambridge professors pursued the sciences, including botany, which had a broad appeal to students, recent graduates, and other university members intending to be ordained into the Church of England.[12]

Continual ambitions to build and diversify a collection designed to express the global extent of God's creation connected the Cambridge Botanic Garden to British imperial projects. Thomas Martyn and the garden's curators aimed to gather, order, and classify examples of all known botanical species to teach the extent of creation and to present "a Natural History of the whole British empire."[13] Unlike many contemporary institutions in Britain that cultivated new species for their perceived medical and economic uses,[14] novelty was not the primary concern of the botanic garden at Cambridge. The garden maintained a global network, often relying on private collectors and other institutions, to gather examples of species that had already been described and named in taxonomic inventories. This network ensured there was sufficient information already associated with specific plants to organize them within rigid taxonomic frameworks and to understand their life cycles and cultivation. The global network that supplied the garden reflected the motivations of students, professors, curators, and other university members for contributing material, shaping the philosophy of imperial botanical collecting enterprises by combining theological agendas with interests in commerce, medicine, and agriculture.

The continued expansion of the Cambridge collection necessitated the development of advanced systems for managing information. Systems of classification and the tools employed to manage this information relied on the close observation and recording of the natural world, an associated set of beliefs and practices that many contemporary naturalists viewed as a route to divine providence.[15] Examining the practices used to catalogue and organize the Cambridge botanical collections according to the Linnaean system of classification, I explore the processes of organizing and

[10] Lisbet Koerner, *Linnaeus: Nature and Nation* (Cambridge, MA, 1999): 123–24.

[11] Richard Walker, *A Short Account of the Late Donation of a Botanic Garden to the University of Cambridge* (Cambridge, 1763), 4.

[12] Aileen Fyfe, "The Reception of William Paley's Natural Theology in the University of Cambridge," *British Journal for the History of Science* 30, no. 3 (1997): 321–35, at 321; Joseph Hardwick, *An Anglican British World: The Church of England and the Expansion of the Settler Empire, c. 1790–1860* (Manchester, 2017).

[13] Thomas Martyn, *Heads of a Course of Lectures in Botany, Read at Cambridge* (London, 1764), vii.

[14] For Kew, see John Gascoigne, *Joseph Banks and the English Enlightenment: Useful Knowledge and Polite Culture* (Cambridge, 1994), 76; Jordan Goodman, *Planting the World: Joseph Banks and His Collectors: An Adventurous History of Botany* (London, 2020). For universities' integration with imperial projects, see Richard Symonds, *Oxford and Empire: The Lost Cause?* (Oxford, 1991).

[15] Anne Secord, introduction to Gilbert White, *The Natural History of Selborne*, ed. Anne Secord (Oxford, 2013), xxiv–xxv.

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accessioning diverse material objects. The arrangement of the living plants and preserved specimens came to be governed by a series of "paper technologies," including letters, printed books, and specimen labels.[16] These practices of managing information originated in the seventeenth century when the interleaving of printed library catalogues became a standard approach to recording new accessions within a specific order, practices applied to natural history collecting by the eighteenth century.[17] The constant adaptation of information processing reflects the changing social hierarchies between Martyn and the five curators employed between 1762 and 1825, all of whom played active roles in ordering and publishing information on the garden's holdings.[18]

In what follows, I identify the early theological, philosophical, and practical approaches to building a botanic garden in the 1760s and 1770s and the means for acquiring plants from across an imperial network. Constant acquisitions and the garden's primary function in university teaching necessitated the development of tools for managing information; annotated books, correspondence, labels, and illustrations became crucial for creating a series of interlocking references designed to cross-reference living plants, herbarium specimens, images, and bibliographical references.

BUILDING A BOTANIC GARDEN

Thomas Martyn was appointed to the botanical professorship as direct successor to his father, John Martyn (1699–1768), who held the post between 1732 and 1762. Thomas Martyn's appointment came two years after the foundation of the Cambridge Botanic Garden when, in 1760, Richard Walker (1679–1764), the vice-master of Trinity College, transferred £1,600 to the university to establish "a public Botanic or Physic garden."[19] The funds were used to purchase the former Augustinian Priory in central Cambridge to house the proposed garden.[20] Walker also established "two offices of a Reader on Plants, and a Curator," the latter to be tasked with cataloguing and organizing the garden.[21] Walker's death in 1764 gave Martyn and Charles Miller (1739–1817), the first curator and son of Philip Miller (1691–1771), head gardener at the Chelsea Physic Garden, the opportunity to

[16] Carla Bittell, Elaine Leong, and Christine von Oertzen, eds., introduction to *Working with Paper: Gendered Practices in the History of Knowledge* (Pittsburgh, 2019), 9. See also Isabelle Charmantier and Staffan Müller-Wille, "Carl Linnaeus' Botanical Paper Slips (1767–1773)," *Intellectual History Review* 24, no. 2 (2014): 215–38.

[17] Ann Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven, 2010), 166, 219, 226; Markus Krajewski, *Paper Machines: About Cards and Catalogs* (Cambridge, MA, 2011), 71; Edwin D. Rose, "Natural History Collections and the Book: Hans Sloane's *A Voyage to Jamaica* (1707–25) and His Jamaican Plants," *Journal of the History of Collections* 30, no. 1 (2018): 15–33; Staffan Müller-Wille and Isabelle Charmantier, "Natural History and Information Overload: The Case of Linnaeus," *Studies in the History and Philosophy of Biological and Biomedical Sciences* 43 (2012): 4–15.

[18] For collaborative working practices in natural history, see Staffan Müller-Wille, "Names and Numbers: 'Data' in Classical Natural History, 1758–1859," *Osiris* 32, no. 1 (2017): 109–28, at 119–20; Bettina Dietz, "Contribution and Co-production: The Collaborative Culture of Linnaean Botany," *Annals of Science* 69, no. 4 (2012): 551–69.

[19] "Dr. Walker's Bond to the University; 1600 £," UA/25.1, fol. 3, CUL.

[20] This land has been referred to as the New Museums Site since the mid nineteenth-century.

[21] Walker, *A Short Account*, 3.

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realize their own vision of how a botanic garden should be organized and interact with the wider world.

Martyn, Miller, and successive curators continued Walker's plan of creating a garden that, rather than serving the medical school as a physic garden, served the theological interests of members of the university (figure 1). Martyn's interests in integrating botany with natural theology reflected his clerical training; as his biographer noted, "Professor Martyn's religious principles were firm and steady. While deeply conversant with the most beautiful works of God, in the inanimate creation, he was not forgetful of their Divine Author."[22] Martyn's combined religious and philosophical approach shaped the Cambridge Botanic Garden and his associated course of lectures alongside a desire to explore the extent and utility of God's creation.

Theological interests formed the core motivation for founding a botanic garden in Cambridge. In 1763, Walker published *A Short Account of a Donation of a Botanic Garden to the University of Cambridge*, outlining how "the study of Botany has for its object the Wisdom and Goodness of God, which is no where more manifest than in the Vegetable part of creation." Walker designed the garden as a teaching collection, allowing students to examine different plants, an exercise that paved the way for them to "answer the gracious end and design for which they [plants] were given."[23] Theological approaches to natural history, and especially botany, reflected the interests of earlier fellows of Trinity College, perhaps the most notable being John Ray (1626–1705). In addition to *Historia Plantarum* (1686–1704), the first attempt to provide an inventory of all known plants, Ray wrote *The Wisdom of God Manifested in the Works of Creation* (1691), in which he explained that all the products of the natural world were manifestations of the Mind of God.[24] By the early eighteenth century, Ray, and the natural philosopher William Derham (1657–1735), had developed a distinctly Anglican-English natural theology in which divine creation had only limited connections to human convenience.[25]

Ray kept a botanic garden at Trinity College in the early 1660s, a tradition Walker resumed in the 1740s through founding a private garden adjacent to the Great Gate of the college. Walker's garden contained a heated glasshouse and accommodated the numerous plants originating in Asia and the Americas that he received from Philip Miller at the Chelsea Physic Garden.[26] Walker, who had completed a doctorate of divinity in 1728, viewed the establishment of a botanic garden as a means of securing Ray's legacy, commenting that a main university Botanic Garden would "prosecute a further search into the useful branch of natural knowledge: where Mr. Ray assures, we shall never want matter for further research."[27]

The tenets of Anglican theology and a wish to display the extent of God's creation through the vegetable kingdom were central to the foundation of the Cambridge

[22] George C. Gorham, ed. *Memoirs of John Martyn, F. R. S., and of Thomas Martyn, B. D., F. R. S., F. L. S., Professors of Botany in the University of Cambridge* (London, 1830), 259.

[23] Walker, *A Short Account*, 1.

[24] Charles E. Raven, *John Ray, Naturalist: His Life and Works* (Cambridge, 1940), 455.

[25] For Ray's reluctance to connect divine creation to its usefulness for human beings, see Scott Mandelbrote, "The Uses of Natural Theology in Seventeenth-Century England," *Science in Context* 20, no. 3 (2007): 451–80, at 467–68; R. J. Berry, "John Ray, Physico-Theology, and Afterwards," *Archives of Natural History* 38, no. 2 (2011): 328–48.

[26] Jane Brown, *Trinity College: A Garden History* (Cambridge, 2002), 25–27.

[27] Walker, *A Short Account*, 2.

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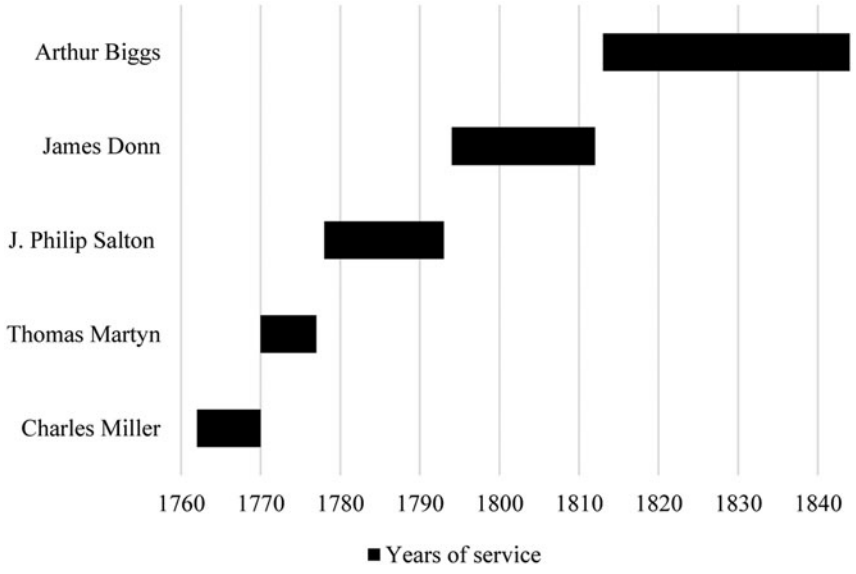

Figure 1—Tenure of curators of the Cambridge Botanic Garden, 1762–1846. From 1770 to 1778, Martyn took on this role alongside the professorship.

Botanic Garden. Walker did, however, acknowledge that the study of botany had some practical applications, observing, "we employ our best faculties and endeavors, to find out the Salutary Virtues of Plants, and their uses for the convenience of Life." This interest was indicated as secondary in statutes of the garden noting that plants should be subjected to regular "Trials and Experiments"—although "Flowers and Fruits must be looked upon as amusements only as these do not want their Excellencies and Uses, they need not be totally neglected."[28]

Walker's interest in exploring the extent of God's creation was enshrined in the garden's statutes, and it was left to Martyn and Miller to interpret these rules when planting and designing the garden. This process coincided with a period of great change in the practice of natural history in Britain, as the system of classification and binomial nomenclature devised by the Swedish naturalist Carl Linnaeus (1707–1778) began to take precedence over Ray's earlier system.[29] This was a result of the brevity and simplicity of Linnaeus's artificial system of classification, grouping plants into classes, orders, genera, and species and forming their unique binomial names from the last two categories. The Linnaean system overcame many of the problems, including synonymy, associated with the polynomials used

[28] Walker, 1, 4.

[29] Edwin D. Rose, "Specimens, Slips, and Systems: Daniel Solander and the Classification of Nature at the World's First Public Museum, 1753–1758," *British Journal for the History of Science* 52, no. 2 (2018): 205–37; Frans A. Stafleu, *Linnaeus and the Linnaeans: The Spreading of Their Ideas in Systematic Botany, 1735–1789* (Utrecht, 1971), 199–231; William T. Stearn, "The Reception of the *Species plantarum* in England and Its Influence on British Botany," in Carl Linnaeus, *Species plantarum: A Facsimile of the First Edition 1753*, vol. 1, ed. William T. Stearn (London, 1972), 75–80.

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by previous naturalists, and thus aided communication.[30] In an early meeting of the trustees of the botanic garden, Martyn announced the importance of using this new systematic approach on a practical and philosophical level: "Whereas it appears to us absolutely necessary in order to facilitate the study of Botany, and to render the Garden of general use, that the plants therein might be ranged and marked according to the system of Linnaeus; and that a Catalogue of them should be printed."[31]

The Linnaean system of classification not only enforced a rigorous organization on the garden that facilitated the influx of exotic species from across the globe but also conformed to many of Walker's and Martyn's theological interests. In the introduction to his *Systema naturae* (1758–59), Linnaeus made it clear that a greater understanding of nature, which necessitated a system of classification, was fundamental for gaining a deeper grasp of God's creation.[32] His declaration reflected the influence of works by Anglican clerics—including those by Ray and Derham, which had appeared in Swedish translations in 1739—who treated natural history as a devotional activity that could be relayed through teaching students, with many of their lectures taking a similar structure and delivery to a religious service. He even opened the tenth edition of *Systema naturae*, the first to consistently use Latin binomial names, with the same quotation from the book of Psalms that Ray used to open his *Wisdom of God*.[33] Linnaeus designed his system to map out the mysteries of creation and move more deeply into God's decrees than any previous natural historian.[34] For the Anglican clerics of Cambridge, this was an attractive proposition, justifying a Linnaean garden and an associated course of lectures.

The Linnaean system provided the perfect framework for the Cambridge Botanic Garden on a theological and practical level. The broad acceptance of the system and associated working practices in British botanical circles by private collectors and institutions, including the British Museum, facilitated advanced communication, aligning Cambridge with foundations such as Kew Gardens. Martyn was well aware of these institutions; in his first course of lectures, he described how "the noble Garden at *Kew* is excellently furnished, and considering how few years it has subsisted is in wonderful Forwardness."[35] The simultaneous use of the Linnaean system initiated the exchange of specimens between Cambridge and Kew, allowing Martyn and his curators to build the Cambridge collection with plants received from across Kew's colonial network.

The Cambridge garden had an associated lecture room, library, and museum. Walker specified that part of the old Mansion House, a dilapidated remnant of the Augustinian Priory, would be "appointed for the Reader's lectures" and "the large unfurnished room above the stairs be made a Library for Books in Botany and other sciences relating thereto: and a part thereof for the Hortus Siccus."[36] This

[30] Rose, "Specimens, Slips, and Systems," 210.

[31] "Rules, Orders, and Proceedings of Dr. Walker's Trustees for the Botanic Garden at Cambridge," UA/Char II. 13, fol. 2, CUL.

[32] Carl Linnaeus, introduction to *Systema naturae per regna tria naturae* (Stockholm, 1758–59).

[33] Sten Lindroth, "The Two Faces of Linnaeus," in *Linnaeus: The Man and His Work*, ed. Tore Frängsmyr (Berkeley, 1983), 1–62, at 12.

[34] Lindroth, "Two Faces of Linnaeus," 12–14.

[35] Martyn, *Heads of a Course of Lectures in Botany*, vi–vii.

[36] Walker, *A Short Account*, 5.

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arrangement ensured a close relationship between the various botanical published works accessioned into the library and the plants added to the garden and herbarium, giving a structure that facilitated the production of systematic catalogues of species. Books supported the binomial names attached to plants and specimens, creating chains of references connecting the library and the collection of dried specimens and living plants.[37] An advanced information management system was central for Martyn's scheme to introduce Linnaean systematics into university teaching. Writing to the botanist Richard Pulteney (1730–1801) in 1791, Martyn noted that his lectures of 1762 "were the first public notices of the Linnaean system, and have contributed much to the spread of it," adding that his teaching program "disseminated knowledge of botany, and of the Linnaean system among us."[38]

This extensive deployment of the Linnaean program required a substantial library to name, describe, and classify species.[39] The books in the library were essentially private tools used to manage a public institution. Martyn outlined a Linnaean arrangement in a plan of the garden published in 1771, showing how the site was divided into specific areas, with plants arranged according to the conventions for botanic gardens specified in Linnaeus's *Philosophia Botanica* (figure 2). Linnaeus's plan designated three different greenhouses each representing a climatic zone, "with walls containing windows facing towards the south."[40] The greenhouses were to be positioned in front of "a museum, which should be oblong, tall and narrow," while the main systematic beds would retain a close association with museum specimens.[41] The Cambridge Botanic Garden was arranged along similar lines, divided into specific areas based on the Linnaean hierarchy and taking the size and climatic requirements of each plant into account. For example, from the early 1770s, tropical species requiring warmer conditions were kept in the south-facing greenhouses, while larger trees and shrubs were placed at the edges of the garden.

That arrangement made Cambridge the first institutional botanic garden in Britain founded on Linnaean principles. It is probable that Martyn received firsthand advice on its layout from those familiar with Linnaeus's garden in Uppsala. An example is Daniel Solander (1733–1782), a student of Linnaeus who had been appointed to reclassify the British Museum's botanical collection according to the Linnaean system in 1763.[42] In 1760, Martyn wrote to Pulteney, "I wish too M. Solander would make a visit here that I might have the pleasure of conversing with a Pupil of Linnaeus's & whom I have heard a very good character."[43] Other British botanic gardens were still arranged according to the earlier systems of classification devised by Ray and Joseph Pitton de Tournefort, and according to various horticultural and medical practices designed to serve the needs of societies of physicians and medical schools. John Hope, professor of botany and materia medica in Edinburgh,

[37] Muller-Wille, "Names and Numbers," 120.

[38] Gorham, *Memoirs of John Martyn*, 191.

[39] Bettina Dietz, "Iterative Books: Posthumous Publishing in Eighteenth-Century Botany," *History of Science* 60, no. 2 (2020): 166–82.

[40] Carl Linnaeus, *Linnaeus' Philosophia Botanica*, trans. Stephen Freer (Oxford, 2006), 331.

[41] Linnaeus, *Linnaeus' Philosophia Botanica*, 332.

[42] Rose, "Specimens, Slips, and Systems."

[43] Martyn to Richard Pulteney, 9 October 1760, MS/238b/28/3, Linnean Society of London. (Hereafter this repository is abbreviated as LSL.)

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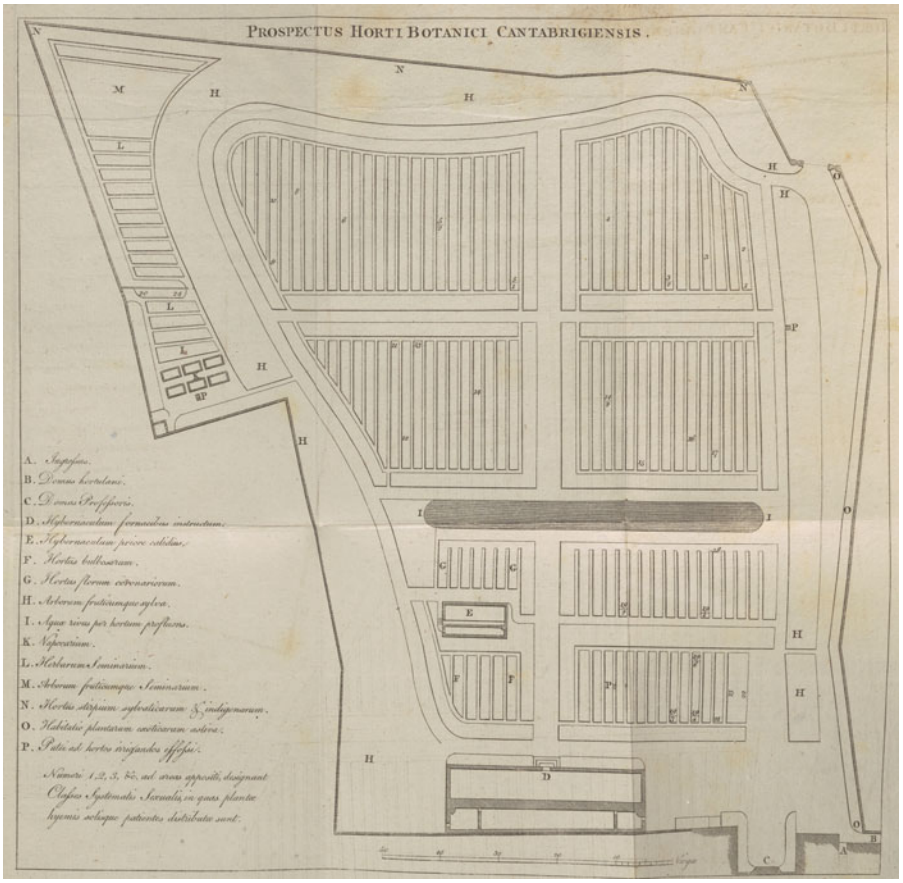

Figure 2—Martyn's plan outlining the Linnaean design of the Cambridge Botanic Garden, published with his *Catalogus Horti Botanici Cantabrigiensis* (1771), Cam.a.771.1, Rare Books, Cambridge University Library. The different alphabetical allocations of space are based on the outline given by Linnaeus in *Philosophia Botanica*. Reproduced by kind permission of the Syndics of Cambridge University Library.

did not start reorganizing the botanic garden there according to the Linnaean system until after 1763. Unlike Martyn, Hope placed an emphasis on the medical and economic properties of plants and did not follow rigid formal Linnaean conventions in the garden's layout.[44] In Oxford, it was not until the 1780s, with the appointment of John Sibthorp as third Sherardian Professor of Botany, that efforts were made to integrate the Linnaean system into teaching and the design of the botanic garden at the university.[45]

[44] Clare Hickman, "'The Want of a Proper Gardiner': Late Georgian Scottish Botanic Gardeners as Intermediaries of Medical and Scientific Knowledge," *British Journal for the History Science* 52, no. 4 (2019): 543–67, at 546–50.

[45] Gascoigne, *Joseph Banks and the English Enlightenment*, 99.

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Martyn's teaching program required a Linnaean garden: he claimed that "to teach this extensive science without a good garden is next to impossible."[46] Given his division of plants into neat parallel rows, it is plausible that Martyn based the design on Solander's advice and published plans of the Uppsala Botanic Garden (figure 3).[47] Martyn and his father, John Martyn, who had laid the foundations for the garden and museum, both corresponded with Linnaeus. In a letter to William Coxe (1748–1828) in 1809, Thomas Martyn wrote, "I had long been acquainted with the *Systema naturae*, *Genera Plantarum*, and *Critica Botanica*, which Linnaeus himself presented to my father."[48] Thomas Martyn's familiarity with these Linnaean publications influenced his design of the garden; following the instructions given in *Philosophia Botanica*, he organized the plants according to the classes, orders, and genera of Linnaeus's sexual system of classification.[49]

GROWING A GLOBAL COLLECTION

A desire to survey the full extent of God's creation inspired the development of a global network to acquire specimens, seeds, bulbs, and living plants. Communication across this network was streamlined through the widespread use of the Linnaean system that both allowed for the identification and description of species and ultimately dictated their physical placement within the garden. In 1761, Walker had received a consignment of plants from the botanist Peter Collinson (1694–1768), who imported and cultivated numerous American species in his garden at Mill Hill in north London. Writing to Walker, Collinson outlined his intent to "Contribute my Mite & by tomorrow Wagon send a Basket of some fine Perennial Ground plants"; he also passed on the names of several nurserymen.[50] Many of Collinson's plants originated in North America, where he maintained a vast correspondence network across which he championed the use of the Linnaean system.

The acquisition of species from the Americas became a priority for Martyn during the 1760s. He stated in his lectures, "The great Enlargement of the *British* Dominions in *America*, has opened a wide Field for New Discoveries and Improvements in Natural History; and the Extensiveness, I might also say, the Universality, of our trade, gives into our Hands the Natural Treasures of every Climate."[51] Martyn's interest in American plants came as a direct result of territorial conquests made during the Seven Years' War that had concluded with the Treaty of Paris in 1763. His lectures on the acquisition of American plants for the garden were inspired by

[46] Martyn, *Heads of a Course of Lectures in Botany*, iii.

[47] Carl Linnaeus, *Hortus Upsaliensis Exhibens Plantas Exoticas, Horto Upsaliensis Academie* (Stockholm, 1748).

[48] Gorham, *Memoirs of John Martyn*, 101. For Martyn's copies of Linnaeus's works, see Carl Linnaeus, *Flora Lapponica: Exhibens Plantas Lapponiam* (Amsterdam, 1737), CCD.47.248, Rare Books, CUL; Carl Linnaeus, *Genera Plantarum: Eoremque Characteres Naturales Secundum Numerum, Figuram, Situm, & Proportionem* (Lugduni Batavorum, 1737), CCD.47.231, Rare Books, CUL; Carl Linnaeus, *Critica Botanica in Qua Nomina Plantarum Generica* (Lugduni Batavorum, 1737), CCC.47.217, Rare Books, CUL.

[49] "Rules, Orders, and Proceedings of Dr. Walker's Trustees," UA/Char.II.13, fol. 4, CUL.

[50] Peter Collinson to Richard Walker, 19 March 1761, in *"Forget Not Mee and My Garden": Selected Letters, 1725–1768, of Peter Collinson F.R.S.*, ed. Alan W. Armstrong (Philadelphia, 2002), 228.

[51] Martyn, *Heads of a Course of Lectures in Botany*, v.

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Figure 3—Cambridge Botanic Garden in 1815; engraving by Joseph Constantine Stadler (ca. 1755–1828) after an illustration by William Westall (1781–1850), showing the greenhouses in the foreground with Kings' College and St. Benet's Church in the background. Wh. 4510, Whipple Museum of the History of Science, University of Cambridge.

aspirations of many prospective priests, the largest group of students in Cambridge during this period, to cross the Atlantic to promote Anglicanism in America.[52]

By 1765, Martyn's interests in classifying and cultivating American plants had become known to his peers at other universities. Writing to Martyn from the Edinburgh Botanic Garden, John Hope described a shipment of "100 parcels of different seeds from Quebec" and offered to "send for your garden at Cambridge a small part of each."[53] Hope's redistribution of duplicate seeds represents the sustained connection between the Cambridge and Edinburgh botanic gardens during the 1760s and reflects contemporary attempts to cultivate North American species in Europe. For example, after returning to Sweden from North America in 1751, the Linnaean apostle Pehr Kalm attempted to cultivate a range of seeds.[54] Cultivating Hope's seeds from Quebec advanced Martyn's desire to "Turn for the Study of Nature to

[52] Hardwick, *Anglican British World*, 27–28, 41, 43–44.

[53] John Hope to Thomas Martyn, 18 February 1765, MSS BANKS COLL MAR, fol. 353, Natural History Museum, London. (Hereafter this repository is abbreviated as NHM).

[54] Frederik Albritton Jonsson, "Climate Change and the Retreat of the Atlantic: The Cameralist Context of Pehr Kalm's Voyage to North America, 1748–51," *William and Mary Quarterly* 72, no. 1 (2015): 99–126; Pehr Kalm, "Peter Kalm's Short Account of the Natural Position, Use, and Care of Some Plants, of Which the Seeds were Recently Brought Home from North America for the Service of Those Who Take Pleasure in Experimenting with the Cultivation of the Same in Our Climate," trans. Ester Louise Larsen, *Agricultural History* 13, no. 1 (1939): 33–64.

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Search for Hidden Treasures of distant Countries, especially those which have been lately added to the Dominions of *Britain* in *America*."[55] Martyn saw it as his task to spread knowledge of these regions to his students, some of whom became priests in the American colonies and, after the 1770s, in India, New South Wales, and Van Diemen's Land.[56]

Martyn had gained some of knowledge of managing global networks in the Americas from his father and predecessor as professor, who had left his collection of botanical books and specimens to the university.[57] As a resident of the village of Chelsea during the 1730s, John Martyn had close connections with Philip Miller and the wealthy collector and plantation owner Hans Sloane (1660–1753).[58] He used specimens received from Miller and Sloane to compile heavily illustrated works, including *Historia Plantarum Rariorum*, published in fascicles from 1728 to 1737 and containing numerous early color copperplate images of American species by Elisha Kirkall (ca. 1682–1742).[59] Several images are based on specimens from John Martyn's herbarium collection.[60] In 1733, he received a consignment of specimens and books from William Houstoun (ca. 1696–1733), a physician hired by the trustees of the Province of Georgia to collect plants from the West Indies and Central America. The trustees intended Houstoun's plants to furnish a new botanic garden in Savannah with the view to stimulating medical and agricultural improvement in the new colony.[61] Houstoun wrote to Sloane from Veracruz in March 1731 about attempts to source specimens of Jalapa, a species commonly used as a purgative: "I have sent up an Indian who has brought me down four small roots of it which I hope will grow, and I believe we shall find it a plant quite different from the marvel of Peru."[62] Houstoun's prolonged stay in Veracruz was a result of his being shipwrecked in the port; because the Spanish authorities did not allow him to explore the nearby province, he employed Indigenous and enslaved people to collect specimens of species with economic and medicinal uses.

Thomas Martyn sought to emulate the complex structures his father relied on to gather specimens, and his own theological interests encouraged him to diversify the provenance of the collection. A main opportunity came when Charles Miller left Cambridge in 1770 to take up a position with the East India Company in a new botanic garden established near Fort Marlborough in Sumatra.[63] Martyn wrote to Pulteney, "[Miller] is gone to the East Indies, to execute a favourite scheme of Mr Sullivan's—the finding and cultivating [of] Nutmegs, or any of the Spices, or indeed any other vegetable productions which may make advantageous objects of commerce."[64] Miller's departure to Asia reflects the integration of the

[55] Martyn, *Heads of a Course of Lectures in Botany*, vii.
[56] Hardwick, *Anglican British World*, 27–28, 41, 43–44.
[57] John Martyn, "Resignation by J. Martyn of the Professorship, 18 Nov. 1761 (original)," UA/CUR 39.16, item 1a, University Archives, CUL.
[58] Thomas Martyn "Manuscript Memoirs of Professor Thomas Martyn," 1821, FAC74/3, fol. 1, Bedfordshire Archives, Bedford.
[59] John Martyn, *Historia Plantarum Rariorum* (London, 1728–1737).
[60] Walters, *Shaping of Cambridge Botany*, 35.
[61] Dorner, "From Chelsea to Savannah," 57.
[62] William Houstoun to Hans Sloane, 5 March 1731, Sloane MS 4052, fol. 82, British Library, London.
[63] Charles Miller to Martyn, 8 March 1771, MSS BANKS COLL MAR, fols. 401–11, NHM.
[64] Martyn to Pulteney, 17 February 1772, MS/2380/28/20, LSL.

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theological agendas of the Cambridge Botanic Garden with the schemes of Lawrence Sullivan, director of the East India Company between 1758 and 1786. Martyn described how Miller's departure "left a considerable additional burden on me," brought on by his "offer to be Curator of the botanic garden without a salary," thus taking on the roles of curator, reader, and professor in an attempt to alleviate the garden's financial problems.[65]

Miller described species he observed in Southeast Asia in the long letters he sent to Martyn, enclosing seeds and specimens and giving detailed accounts of the natural history and local customs. Writing from Fort Marlborough in 1771, Miller promised to send Martyn "a few seeds, by next years ships, in order to contribute to the increase of your collection."[66] Martyn received many specimens collected on Miller's numerous journeys throughout Sumatra, several "performed on foot by such Roads, & through such swamps & as would have been looked upon in Europe as absolutely impassable."[67]

During these journeys, Miller relied on the Batak, a group indigenous to Northern Sumatra. He travelled through the rainforest to visit Batak villages, collecting information about local customs. He described how the skulls of criminals and vanquished warriors were "hung up as Trophies in the houses,"[68] but he believed the Batak posed few risks to European travelers, and they assisted him in his botanical work: "[I]t is from their country most of the Cassia [cinnamon] sent to Europe is procured; & I went there in hopes of finding the Cinnamon also: but after researches & enquiries I could not meet with it. The Cassia Tree, of which I enclose you a small branch, grows to 50 or 60 feet in height, & asked the Country People to get me some; but they have a notion that it produces nothing neither."[69] Miller's description emphasized the agency of Indigenous groups in the collecting process and their lack of interest in collecting species that had a distinct commercial value for Europeans.[70] Miller valued the knowledge local people communicated, relaying details to Martyn on specimen labels.[71] The example of cinnamon illustrates how important communication with Indigenous groups was for understanding the properties of unfamiliar plants; information reported back to Cambridge was integrated into a teaching program that sought to relay the diversity of botanical species and their uses across the British Empire.

Martyn fostered relationships with other global travelers to augment the collection. His contacts included Joseph Banks and Daniel Solander, whom he visited in 1772 shortly after their return from James Cook's first circumnavigation. Martyn described the event in a letter: "Last week I had the pleasure of spending a morning with Mr. Banks and Dr. Solander: you will easily imagine how delighted

[65] "Rules, Orders, and Proceedings of Dr. Walker's Trustees," UA/Char. II. 13, fol. 3, CUL.
[66] Miller to Martyn, 8 March 1771, MSS BANKS COLL MAR, fol. 405, NHM.
[67] Quoted in William Marsden, *The History of Sumatra* [. . .] (London, 1783), 294–95.
[68] Miller to Martyn, 9 May 1772, MSS BANKS COLL MAR, fol. 407v, NHM.
[69] Miller to Martyn, 9 May 1772, MSS BANKS COLL MAR, fol. 407, NHM.
[70] See the contributions in Kate Fullagar and Michael McDonnell, eds., *Facing Empire: Indigenous Experiences in a Revolutionary Age* (Baltimore, 2018); Sujit Sivasundaram, *Waves across the South: A New History of Revolution and Empire* (London, 2020).
[71] Specimen label, Martyn Collection, CGE08292, Cambridge University Herbarium.

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I was to turn over the 3000 specimens of plants, 1000 of them new species; and colored drawings of 700, all elegantly & accurately done upon the spot; as were also very full descriptions; these Gentlemen expect in less than a month to set out for the Southern World, with three ships most royally equipped, and four draughtsmen, one for views & figures—the celebrated Zoffanii—and three for natural history."[72]

In addition to examining Banks's specimens and illustrations, Martyn received duplicate herbarium specimens, which he added to the Cambridge Botanical Museum to allow students to study the extent of divine influence in the Pacific Ocean. *Senecio tricuspidatus*, a species endemic to Patagonia and Tierra del Fuego, retains an original label in Banks's hand referencing the "Banks Mss."[73] The label cites the manuscripts that Banks and Solander compiled during James Cook's first voyage, including Banks's "Catalogue of the Plants," which Martyn viewed on his visit.[74] Banks's manuscript listed the number of specimens collected in each locality during Cook's voyage and where they were stored in the drying books.[75] Banks, Solander, and their field assistants had collected seven examples of *Senecio tricuspidatus*, including the specimen presented to Martyn.

Martyn continued to gather new species well into the nineteenth century with the aid of various curators, including James Donn (1758–1813) and Arthur Biggs (d. 1846), who sought to integrate the Botanic Garden's imperial collecting program with the university's broader administrative structures. By 1815, Biggs was using the garden's audit book to record the expenses associated with the carriage of seeds from Paris, Vienna, Gottingen, Moscow, and Königsberg.[76] This practice reflects Cambridge's participation in a pan-European network of botanic gardens, stimulated by the connections Martyn made during his grand tour of 1779–1782, forging bonds with new universities founded by the Prussian state during the Napoleonic Wars while redistributing species he collected on other European imperial voyages. Seeds and specimens were often accompanied by catalogues of European botanic gardens, a typical example being an interleaved copy of Grigoriĭ Fedorovich Sobolevskiĭ's *Catalogus Plantarum horti imperialis medici botanici Petropolitani* (1796).[77] Sobolevskiĭ's catalogue of the St. Petersburg Botanic Garden followed a similar Linnaean arrangement to that in the Cambridge Botanic Garden's published catalogues.[78]

Thus, the simultaneous use of the Linnaean system by botanical curators facilitated global exchange. By 1815, Biggs was recording postage charges for plants collected from across the British Empire, including a parcel of seeds from the Calcutta Botanic Garden. Many of these specimens had been cultivated in Calcutta with assistance from local Indians; the relationship with Cambridge was facilitated by its strong

[72] Martyn to Pulteney, 17 February 1772, MS/2380/28/20, LSL.

[73] *Senecio tricuspidatus*, Martyn Collection, CGE08044, Cambridge University Herbarium.

[74] Joseph Banks, "Catalogue of Plants Collected at Madeira, Brazil, Tierra Del Fuego and the Society Islands Arranged for Each Locality in the Order of Linnaeus' Species Plantarum, 1762," MSS BANKS COLL, fol. 2, Library and Archives, Botany Special Collections, NHM.

[75] Simon Werrett, *Thrifty Science: Making the Most of Material in the History of Experiment* (Chicago, 2019), 71.

[76] Audit Book, 1776–1828, Michaelmas, 1814–1815, UA/Misc.Collect.21, CUL.

[77] Grigoriĭ Fedorovich Sobolevskiĭ, *Catalogus Plantarum Horti Imperialis Medici Botanici* (Petropolitani, 1796). Martyn's interleaved copy is at CCD.47.183, Rare Books, CUL.

[78] Audit Book, 1776–1828, UA/Misc.Collect.21, fols. for Michaelmas 1797, CUL.

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links with Kew and simultaneous use of the Linnaean system to communicate information.[79] The practice of recording costs associated with shipments of plants and seeds from across Europe and the wider world in the university audit book illustrates a movement away from Martyn's private network and the integration of the process of gathering information within the university's main financial and administrative structures.

Even as this change was taking place, Martyn's personal network continued to develop the collection. This was assisted by the numerous connections Martyn made in London, where he resided in the 1780s and "was received fellow of the Linnean Society of London, lately instituted at London, and then meeting at the house of Dr. Smith on Great Marlborough Street. He was afterwards elected one of the Vice-Presidents, in which office he continued as long as he resided in London."[80] Martyn maintained these connections for the rest of his life. In 1821, he wrote to James Edward Smith (1759–1828), then president of the Linnaean Society of London, "Some time since I sent the Curator [at Cambridge] a parcel of seeds which I had received, with a box of specimens, from Van Diemen's Land; but I have never heard whether they succeeded. Some of them grew with me under many disadvantages."[81] Martyn forwarded the specimens to Smith, describing how "of many species there is such abundance of specimens, that you may oblige all your friends . . . I offered the seeds to Sir Joseph Banks, but he seemed to think they had them at Kew, and regarded the Garden at Cambridge as the most proper place for them."[82]

Individuals who sent specimens from Van Diemen's Land (Tasmania) and New South Wales to botanical professors and aristocratic patrons such as Banks included Charles Fraser (1788–1831), the first state botanist of New South Wales, who visited Van Diemen's Land in 1818.[83] The botanist Allan Cunningham (1791–1839) undertook his first voyage to Van Diemen's Land in 1819 and collected numerous botanical specimens, sending many to powerful patrons and institutions in Britain. Like Charles Miller in Sumatra, Cunningham observed Indigenous culture in Van Diemen's Land, compiling a vocabulary of the local Aboriginal languages while communicating with local people to understand the uses of plants.[84]

Numerous donations made to the Cambridge garden by members of the university remained an essential source for new specimens. In 1807 the then curator James Donn made "his acknowledgements to those friends of the Botanic Garden, (as well as Members of this University as possessors of Collections) who have persevered in advancing its credit by Their liberal contribution of rare and new Species."[85]

[79] Khyati Nagar, "Between Calcutta and Kew: Divergent Circulation and Production of Hortus Bengalensis and Flora Indica," in *The Circulation of Knowledge between Britain, India, and China*, ed. Bernard Lightman, Gordon McOuat, and Larry Stewart (Leiden, 2013), 153–78.

[80] Thomas Martyn, "Manuscript Memoirs of Professor Thomas Martyn," 1821, FAC74/3, fol. 26, Bedfordshire Archives.

[81] Martyn to Smith, 9 March 1821, GB-110/JES/Add/72, LSL.

[82] See Gorham, *Memoirs of John Martyn*, 252. This published letter is heavily abridged; the original is in a private collection.

[83] Jim Endersby, "A Garden Enclosed: Botanical Barter in Sydney, 1818–39," *British Journal for the History of Science* 33, no. 3 (2000): 313–34, at 319.

[84] Philip A. Clarke, *Aboriginal Plant Collectors: Botanists and Australian Aboriginal People in the Nineteenth Century* (Kenthurst, 2008), 74.

[85] James Donn, *Hortus Cantabrigiensis; or, A Catalogue of Plants Indigenous and Exotic*, 4th ed. (Cambridge, 1807), i.

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Such donors included Edward Daniel Clarke (1769–1822), professor of mineralogy at Cambridge and university librarian, who collected plant specimens, books, manuscripts, antiquities, and a variety of other objects during his travels through Europe, Scandinavia, Asia, the Levant, and North Africa.[86] Clarke's botanical specimens were accessioned into the garden's collection; by 1821, Cambridge guidebooks referred to the "many rare plants, collected by Dr. E. D. Clarke, in his travels into Greece, Egypt, &c."[87] These journeys were influenced by his interests in classics, biblical scripture, and natural theology, following routes described in the Bible and classical texts.[88] In a poem written toward the end of his life, Clarke laid out how collecting botanical specimens provided a route to divine providence: "The Deity display'd, and all his power; / Beheld in every herb, in every plant."[89]

Aware that these materials had to be organized according to the Linnaean system, Clarke collected relevant botanical texts in addition to specimens. In Sweden, he acquired texts of prominent Linnaean naturalists.[90] Writing to William Otter (1768–1840) from Tronheim on 23 September 1799, Clarke noted that Daniel "Solander lived at Pitea, in Westro Bothnia, and in that neighbourhood I procured the Flora Suecia of Linnaeus, with his manuscript annotations."[91] Clarke's interest in the provenance of this book reflects Cambridge academics' consistent use of the Linnaean system and their interests in its development in relation to their theological agendas.

The Cambridge Botanic Garden's aspiration to survey the extent and utility of God's creation necessitated building connections with imperial projects. The global range of the botanical species in its collections reflects the variety of different methods of acquisition ranging from Martyn's personal connections to the official correspondence of the curators and the specimens donated by university members. Integrating new specimens in the collection required sophisticated information-management structures, a process explored in the next section.

MANAGING INFORMATION

The Cambridge Botanic Garden's development of systems for managing information and classifying accessions according to the Linnaean system relied on a range of botanical books dating from the sixteenth century through to contemporary publications. The garden's general impoverishment made it difficult to build a library. As a result, Martyn and Miller had to source books from donations, their own private

[86] Brian Dolan, *Exploring European Frontiers: British Travelers in the Age of Enlightenment* (London, 2000).

[87] *The New Cambridge Guide: Or, A View of the University, Town, and County of Cambridge* (Cambridge, 1821), 25.

[88] Jonathan R. Topham, *Reading the Book of Nature: How Eight Best Sellers Reconnected Christianity and the Sciences on the Eve of the Victorian Age* (Chicago, 2022), 70.

[89] As quoted in William Otter, *The Life and Remains of Edward Daniel Clarke; Professor of Minerology in the University of Cambridge*, vol. 1 (London, 1825), 69.

[90] Angela Bryne, *Geographies of the Romantic North: Science, Antiquarianism, and Travel, 1790–1830* (New York, 2013), 98.

[91] Otter, *Edward Daniel Clarke*, 476. Solander's annotated copy of Linnaeus's *Flora Suecica* (1745) that Clarke obtained is held by the Cambridge University Library: Adv.c.69.1, Rare Books, CUL.

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collections, and Cambridge college libraries.[92] In February 1767, Martyn's fellowship at Sidney Sussex College allowed him to borrow copies of John Ray's *Historia Plantarum* and nine related books—including *Gerarde's Herbal*—volumes he returned more than two years later, over a period from February to November 1769.[93] The long borrowing times indicate Martyn's and Miller's consistent use of the books to identify, describe, and order plants in the garden and museum.

While embodying necessary theological outlooks, the Linnaean system and binomial nomenclature provided the basis for a clear cataloguing structure for the garden from the 1760s onward. It embodied the regular use of annotated books by curators, professors, and students when identifying, describing, and locating plants, introducing new species within the physical and philosophical confines of the Linnaean system. By 1764, Walker noted, "[W]e have already introduced about 3000 new plants into the garden given by Mr. Miller of Chelsea and other Friends and we have reason to expect as many more next spring."[94] Walker also outlined the role of the curator, who "shall always be so well skilled in the System of Botany, as to arrange his plants in their proper order."[95] To fulfil this requirement, Charles Miller established a rigid systematic order to facilitate university teaching by making it possible to locate, identify, and assess the placement of specific living examples of species through the Linnaean system.

Many species cultivated in the garden were not new to the Linnaean system; they were already listed in *Systema naturae* (1758) and *Species plantarum* (1762–63), the most complete systematic inventories of all known plants and the first to endorse consistent use of Linnaeus's binomial nomenclature. In gathering species already known to European naturalists, the garden was developing a teaching collection designed to outline the extent of God's creation. The primary purpose of the annotated copies of Linnaeus's works kept by Miller and Martyn was not to integrate the names and diagnoses of new species, a practice used by institutions and private collectors who sought to collect new species, but to use information gathered through repeated observations of living plants to reorganize descriptions and the classificatory structures. Examples can be found throughout Miller's interleaved copy of *Systema naturae*, as he uses the blank pages to revise the descriptive diagnoses of the physical characters and their systematic arrangement (figure 4).[96] Miller's revisions are keyed to the species numbers ascribed by Linnaeus. Species 21 relates to *Veronica aruensis*, commonly known as Green-Field Speedwell, next to which Miller's notes add a description of the peduncle and solitary flowers, refining Linnaeus's printed

[92] Books donated by the founder Richard Walker and the physician John Wilmer include Pier Antonio Micheli, *Nova Plantarum Genera* (Florence, 1729), Rare Books, CCB.47.60, CUL; James Douglas, *A Description of the Guernsey Lilly* (London, 1737), Rare Books, CCA.47.56, CUL.

[93] Register of Books Borrowed from the Library 2, fol. 19, Sidney Sussex College.

[94] Richard Walker, "A Short Account of the late Donation of a Botanic Garden to the University of Cambridge by the Reverend Doctor Walker Vicemaster of Trinity College," UA/Botanik Garden 1717–1883, CUR 25.1, item., 5*, CUL.

[95] Walker, "A Short Account of the late Donation of a Botanic Garden to the University of Cambridge by the Reverend Doctor Walker Vicemaster of Trinity College," UA/Botanik Garden 1717–1883, CUR 25.1, item., 5*, CUL.

[96] Linnaeus, *Systema naturae* (Stockholm, 1758). For Miller's interleaved copy, see CCC.47.208–209, Rare Books, CUL.

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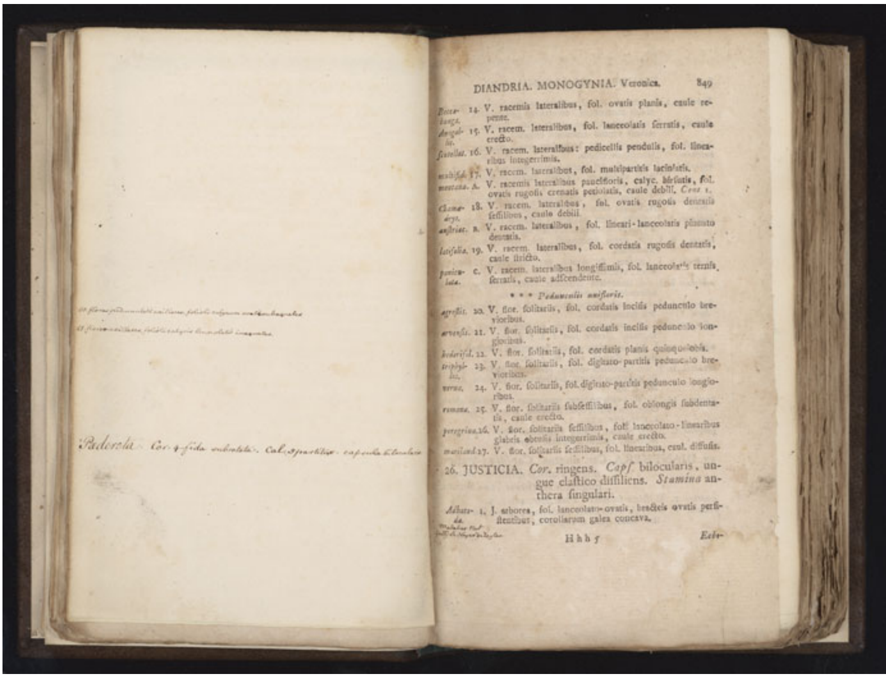

Figure 4—Charles Miller's annotated copy of *Systema naturae* (1758), CCC.47.208, Rare Books, Cambridge University Library, showing notes relating to species of *Veronica* and the addition of *Pæderota* on the opposite interleaved page. Reproduced by kind permission of the Syndics of Cambridge University Library.

diagnosis emphasizing the auxiliary nature of the flowers and the lobes of the leaves.[97] These notes link to surviving herbarium specimens. Martyn transcribed the diagnoses listed in *Systema naturae* for *Veronica incana* onto the specimen label, adding, "Hort. Cant Jul. 27 1761," the date the plant was collected in the botanic garden.[98]

Miller's annotations in *Systema naturae* and Martyn's specimen labels indicate the close working relationship between the botanical professor and curator. A new genus Miller added to his interleaved copy of *Systema naturae* is *Pæderota*, a revision added after the publication of the 1762–63 edition of *Species plantarum* (figure 4). Martyn often cited *Species plantarum* on the labels attached to the herbarium specimens, alongside *Systema naturae* and *Hortus Upsaliensis*. These notations relate to his own copy of *Species plantarum* (1762–63), a book interleaved with large sheets of paper and bound into three volumes. As Miller did with *Systema naturae*, Martyn used *Species plantarum* to update references and add descriptive information. In the case

[97] Linnaeus, *Systema naturae* (Stockholm, 1759), Miller's interleaved copy, CCC.47.208: 849, CUL.
[98] *Veronica incana*, Martyn Collection, CGE09050, Cambridge University Herbarium.

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of *Pæderota*, Martyn cross-referenced this text with a description from Linnaeus's *Amoenitates Academicæ*.[99]

To align the Linnaean systematic arrangement with the garden's practical management, Charles Miller used an annotated copy of *The Gardener's Dictionary*, a book authored by his father, Philip Miller. Published just before the foundation of the Cambridge Botanic Garden in 1759, the edition Charles Miller annotated was produced prior to British naturalists' full acceptance of the Linnaean system and binomial nomenclature. The printed text continued to use earlier polynomial names.[100] As this edition was produced, Philip Miller started to use Linnaean systematics, stating in its preface, "the new System of Botany, published by Dr. Linnaeus, was now more generally studied than any other."[101] He acknowledged that Linnaean binomials "would soon be more known . . . than any other." To integrate this book with the Linnaean system, Charles Miller annotated specific Linnaean names in the text's margins, linking descriptions on how to cultivate specimens with binomials published in *Species plantarum* (1762–63).[102]

The ability to cross-reference Linnaean binomials with Philip Miller's *Gardeners Dictionary* united the systematic and practical management of the garden. This was crucial for understanding the properties of specific species, providing the framework to fulfil Richard Walker's original intent "that one trial should be made yearly upon a certain number of these plants."[103] Miller concentrated his experiments on species arranged under the genus *Triticum*, commonly known as wheat.[104] The agricultural potential of wheat and related species was of particular importance to Martyn, Miller, the sons of the landed gentry, and the prospective priests who attended the botanical lectures. These interests gave Miller a clear incentive to undertake experiments on wheat. In 1768, he communicated an account of his experiments to the London physician and Linnaean proponent William Watson, describing how "one grain of wheat only, in little more than a year" produced "a much more considerable quantity of grain, than was ever attempted, or ever conjectured possible."[105] These experiments on increasing yields were intended to promote agricultural improvement, following a long tradition in Cambridge botany. In 1725, Richard Bradley, the first professor of botany, had stressed the usefulness of a botanic garden when performing "Experiments tending to the improvement of land, which may be a means of increasing the estate of every man in England."[106]

[99] Carl Linnaeus, *Species plantarum exhibentes plantas rite cognitas, ad genera relatas, cum differentiis specificis, nominibus trivialibus, synonymis selectis, locis natalibus, secundum systema sexuale digestas* (Stockholm, 1762–63), 20, L.IV.753(762), LSL.

[100] Miller did not employ consistent Linnaean binomials in *The Gardeners Dictionary* until 1768. See William T. Stearn, "Miller's Gardener's Dictionary and Its Abridgement," *Journal of the Society for the Bibliography of Natural History* 7, no. 1 (1974): 125–41.

[101] Philip Miller, *The Gardeners Dictionary* [. . .] (London, 1759), CCF.47.65, p. 1, Rare Books, CUL.

[102] This edition of *Species plantarum* is cited in manuscript under the genus *Clusia*; see Miller, *Gardeners Dictionary*, CCF.47.65, Rare Books, CUL, at CLU.

[103] Walker, *A Short Account*, 4.

[104] Miller, s.v. "Triticum," *Gardeners Dictionary*, CCF.47.65, Rare Books, CUL.

[105] Charles Miller, quoted in William Watson, "An Account of some Experiments, by Mr. Miller of Cambridge, on the sowing of Wheat," *Philosophical Transactions*, no. 58 (1768): 203–6; see also Hickman, *Doctor's Garden*, 139.

[106] Richard Bradley, preface to *A Survey of the Ancient Husbandry and Gardening* [. . .] (London, 1725), n. p.

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Agricultural experiments, however, remained a secondary priority in the Cambridge Botanic Garden. The main interest of Martyn and successive curators was to gather species to show the diversity of God's creation. This is represented through the first catalogue of the garden, Martyn's *Catalogus Horti Botanici Cantabrigiensis* (1771), a systematic list of every species in the garden.[107] Martyn arranged the *Catalogus* according to the Linnaean system, making it possible for attendees of his lectures to locate, identify, and compare different plants. Martyn's *Catalogus* was compiled from a Linnaean list of binomial names and systematic diagnoses, often condensed descriptions of plants present in the Cambridge Botanic Garden. A year later, Martyn published a short appendix, *Mantissa Plantarum*, listing new species accessioned into the garden since the publication of the *Catalogus*.[108] These systematic catalogues required access to large library collections from which Martyn gathered supportive references; hence the long borrowing times for books from Sidney Sussex College library in the late 1760s.

Martyn's *Catalogus* and *Mantissa* were the first in a series of catalogues designed to inventory the garden's global collection, and their publication was followed by several improvements to the garden and museum to facilitate the addition of tropical plants. In 1775, Martyn was granted £100 to "alter and enlarge the Stove, to repair the Greenhouse and to do several other necessary works."[109] Extensions to the greenhouse allowed the cultivation of a greater range of exotic species, and the museum was likewise renovated to increase its capacity.[110] To ensure the incorporation of new species into the Linnaean information-management system, Martyn had one copy of his *Catalogus* interleaved with blank pages, to be annotated with new names and descriptions as material was received from across the globe (figure 5).[111] This practice was similar to that employed by Linnaeus and his son, who kept an interleaved copy of *Hortus Upsaliensis* (1748). Linnaeus's volume listed all the species held by the Uppsala Botanic Garden, and the annotations named and described species added to the garden.[112] Martyn was familiar with these practices and had been using an interleaved copy of his father's *Methodus Plantarum Circa Cantabrigiam* (1727) since the 1750s,[113] a book he carried on excursions across Cambridgeshire, using the blank pages to add information on specific species.[114]

Martyn's annotations in the interleaved *Catalogus* concerned species sourced from a global network and cultivated in Cambridge after the completion of the greenhouses. To facilitate their management, he developed a key relating to the life cycle and location of the plants: "A" for annual, "P" for perennial, "B" for biennial, "H" for hardy, "GH" for greenhouse, "S" for stove, "Sh" for shrubbery, and "T" for

[107] Thomas Martyn, *Catalogus Horti Botanici Cantabrigiensis* (Cambridge, 1771).

[108] Thomas Martyn, *Mantissa Plantarum horti botanici Cantabrigiensis* (Cambridge, 1772).

[109] "Rules, Orders, and Proceedings of Dr. Walker's Trustees," UA/Char. II. 13, fols. 4–5, CUL.

[110] "Rules, Orders, and Proceedings of Dr. Walker's Trustees," UA/Char. II. 13, fol. 4, CUL.

[111] Staffan Müller-Wille, "Linnaean Paper Tools," in *Worlds of Natural History*, ed. Helen Curry et al. (Cambridge 2018), 205–20.

[112] Linnaeus, *Hortus Upsaliensis* (Stockholm, 1748), interleaved copy from Linnaeus's collection, BL.880/7, LSL.

[113] John Martyn, *Methodus Plantarum circa Cantabrigiam Nascentium* (Cambridge, 1727). Thomas Martyn's interleaved copy is at Cambridge University Library: CCE.47.49, CUL.

[114] Christopher D. Preston, "The Abortive Edition of John Martyn's *Methodus Plantarum Circa Cantabrigium Nascentium* (c. 1729)," *Archives of Natural History* 47, no. 1 (2020): 41–50, at 45.

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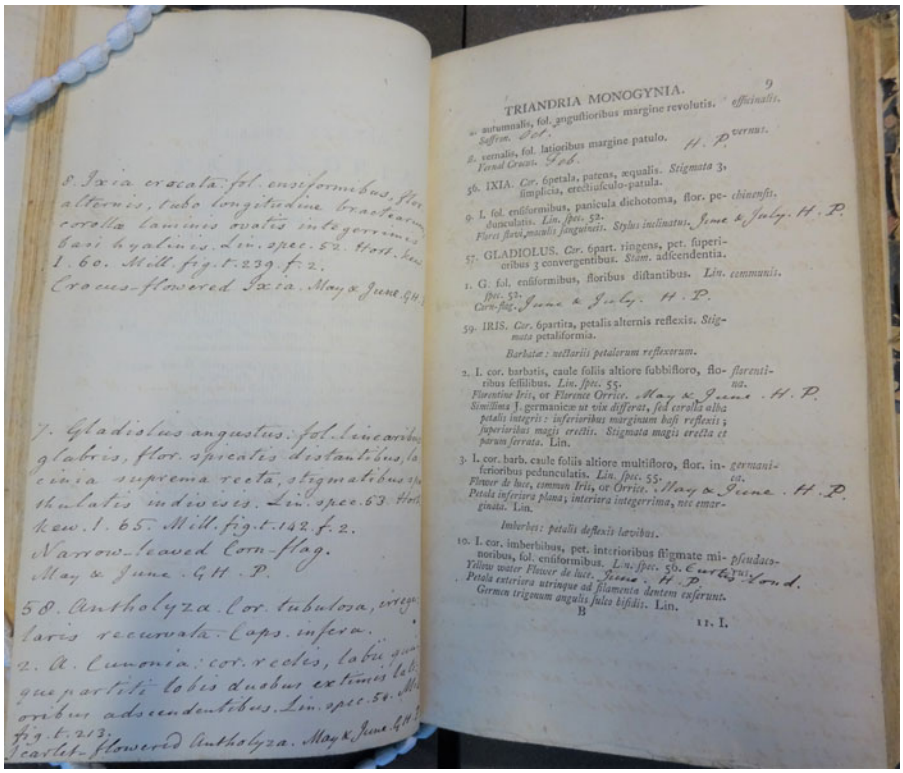

Figure 5—Thomas Martyn's interleaved copy of *Catalogus Horti Botanici Cantabrigiensis* (1771), Copy 3, Cory Library, Cambridge Botanic Garden. Martyn used the interleaved pages to insert descriptions of tropical species acquired since the building of the greenhouse in 1772. Reproduced with permission of the Cory Library, Cambridge University Botanic Garden.

tree.[115] Those species described in the printed text had been present in the collection since the 1760s, when Charles Miller was curator, and were keyed to "HP," indicating perennials and hardy biennials. In contrast, many species described in Martyn's annotations had to be kept in the new greenhouse and stove house to ensure their survival. These included *Protea conifera*, a species endemic to the Western Cape, *Canna glauca* from North America, and *Justicia hyssopifolia* from the Canary Islands;[116] specimens of them were represented in Martyn's herbarium. Many annotations on the interleaved pages include the key "GH.P," indicating that these species are perennial so long as they are kept in the greenhouse. One plant described on an interleaved page is *Ixia crocata*, which originated from the Cape of Good Hope. Next to this annotation, Martyn added references to Linnaeus's *Species plantarum* (1762–63),

[115] Martyn, *Catalogus Horti Botanici Cantabrigiensis*, first endpaper, copy 3, Cory Library, Cambridge Botanic Garden.

[116] Martyn, *Catalogus Horti Botanici Cantabrigiensis*, copy 3, at 1, 5, 9, Cory Library, Cambridge Botanic Garden.

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Philip Miller's *Figures of the Most Beautiful, Useful and Uncommon Plants* (1755), and William Aiton's *Hortus Kewensis* (1789).[117]

Martyn's citations of Linnaeus's and Miller's works were central to the cross-referencing of published names, descriptions, illustrations, specimens, and living examples held by the garden and museum. Many names of species, including *Ixia crocata*, were accompanied by a network of references giving mutual support to the note, cross-referencing the Linnaean description with an illustration commissioned by Miller, who first cultivated this species in the Chelsea Physic Garden after receiving seeds from the Cape.[118] Miller commissioned the image of *Ixia crocata* from the German botanical illustrator and engraver John Miller (also known as Johann Sebastian Müller), and it depicts the flowers, showing the sexual organs in particular detail. The number of pistils and stamens supported Linnaeus's published name, description, and placement of this species in the genus *Ixia* and the class *Triandria*, an arrangement Martyn emulated in his *Catalogus*.[119] References to the published illustrations and descriptions were further supported by the dried specimen in Martyn's herbarium and the living plant kept in the greenhouses (figure 6).[120] These four reference points provided the mix of composite images and specific examples necessary to support the classification of the species.[121] The descriptions, specimens, and archetypal illustrations were used to examine the plant when it was not flowering—an event that, according to Martyn's annotation, took place only between May and June after the main university terms had ended and few students were present in Cambridge.[122]

The reference to Aiton's *Hortus Kewensis* (1789) reflects the integration of practices used to gather specimens for the Cambridge Botanic Garden with those of Kew Gardens from the early 1770s. Cambridge became a beneficiary of numerous seeds, bulbs, and plants sent out from Kew, repurposing them to integrate botany with natural theology. *Hortus Kewensis* had a similar purpose to Martyn's *Catalogus*, listing in its first edition 5,500 species present at Kew. Aiton employed a key similar to that used by Martyn, defining the life cycle, preferred climatic conditions, and size of plants.[123] The close structural and systematic links between Martyn's *Catalogus* and Aiton's *Hortus Kewensis* illustrate how the use of the Linnaean system facilitated the production of published catalogues while providing a framework that allowed institutions to exchange material and information. This increased the number of species held in Kew and Cambridge, sharing the proceeds of a whole range of

[117] Linnaeus, *Species plantarum* (1762–63), 52; Philip Miller, *Figures of the Most Beautiful, Useful and Uncommon Plants Described in the Gardener's Dictionary*, vol. 2 (London, 1755), table 239, fig. 2; William Aiton, *Hortus Kewensis: Or, a Catalogue of the Plants Cultivated in the Royal Botanic Garden at Kew*, vol. 1 (London, 1789), 60.

[118] Miller, *Figures* [. . .] *in the Gardener's Dictionary*, 2:160, table 329.

[119] Karin Nickelsen, *Draughtsmen, Botanists, and Nature: The Construction of Eighteenth-Century Botanical Illustrations* (Dordrecht, 2006), 83–84.

[120] *Ixia crocata*, Martyn Collection, CGE08339, Cambridge University Herbarium.

[121] Joeri Witteveen, "Supressing Synonomy with a Homonym: The Emergence of the Nomenclatural Type Concept," *Journal of the History of Biology* 49, no. 1 (2016): 135–89, at 165.

[122] Martyn, *Catalogus Horti Botanici Cantabrigiensis*, copy 3, opposite 9, Cory Library, Cambridge Botanic Garden.

[123] Aiton, *Hortus Kewensis*, xxx.

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Figure 6—*Left*: Illustration of *Ixia crocata* from Philip Miller's *Figures of the Most Beautiful, Useful and Uncommon Plants* (1755), S.370.bb.76.1, Rare Books, CUL. The *Ixia crocata* is referred to by Martyn in the annotated *Catalogus* (1771) now held by the Cory Library, Cambridge Botanic Garden. Reproduced by kind permission of the Syndics of Cambridge University Library. *Right*: The specimen that represents the species *Ixia crocata* from Martyn's herbarium, CGE00008339, Cambridge University Herbarium. Reproduced by kind permission of Cambridge University Herbarium, Department of Plant Sciences, University of Cambridge.

networks and the patronage of powerful figures such as Banks, Lord Bute, and Aiton, Kew's first director.[124]

The process of managing information became the responsibility of the garden's curator. In 1778, Martyn was replaced as curator, although not professor, by John Salton, who relied on a similar array of annotated books. Salton annotated Martyn's interleaved copy of the *Catalogus*, adding numerous names, descriptions, and geographical origins of species entering the garden. Examples include *Nolana prostrata*, a hardy annual originating in Peru that flowers between July and September in the northern hemisphere.[125] Another is *Morus papyferia*, which Salton

[124] For John Stuart, third Earl of Bute and seventh prime minister of Great Britain, see David P. Miller, "'My Faivorite Studdys': Lord Bute as Naturalist," in *Lord Bute: Essays in Reinterpretation*, ed. Karl W. Schweizer (Leicester, 1989), 213–40.

[125] Martyn, *Catalogus Horti Botanici Cantabrigiensis*, copy 3, at 29, Cory Library, Cambridge Botanic Garden.

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described as the "Paper Mulberry," originating from "Japan and the South Seas Isles."[126] Its inclusion reflects the increased interest in the Pacific that began at the time of Martyn's survey of Banks's collection in 1771. Pacific travelers had emphasized *Morus*'s economic potential and its use to produce bark cloth, often known as *tapa*, by Indigenous groups in Polynesia. However, Salton only identified this species, indicating that its economic importance was not a primary concern in Cambridge. Rather, Salton was interested in extending the garden's holdings of Pacific flora in conformity with the theological intent of showing the extent of God's creation.

The interleaved *Catalogus* was also used to record and classify numerous specimens that Martyn sent to Cambridge during his grand tour of Europe between 1779 and 1781. In accessioning them into the collection, Salton recorded whether the species were cultivated in the garden or accessioned as herbarium specimens. For example, on accessioning *Cacalia hastrata*, which Martyn collected near the Swiss glacier of Grindelwald on 3 August 1779, Salton added the name and diagnoses of this species to the *Catalogus* while keying it "H.P.," for hardy perennial.[127] Salton's notes show that he cultivated this species in the botanic garden and added representative specimens to the herbarium.[128] The increased prevalence of Salton's hand in the *Catalogus* and Garden Audit Book reflects the broader changes taking place in natural history from the 1780s, as Linnaean practices of recording, ordering, and organizing information lost their prestige and were relegated to clerical work.[129]

Salton used both his and Martyn's annotations in the interleaved *Catalogus* to publish another catalogue in 1794, the anonymous *Horti Botanici Cantabrigiensis Catalogus*.[130] However, unlike Martyn's *Catalogus*, Salton's *Horti Botanici* is a simple checklist of Linnaean binomial names, omitting any information on the physical placement of species in the garden, preferred climatic conditions, and common names. The binomials are all based on those given by Linnaeus in *Species plantarum* and are listed according to the Linnaean system, divided by subheadings outlining the Linnaean classes and orders, with the generic names listed on the left-hand side of the page. Salton's use of the single binomial shows his interest in linking the printed catalogue with the labels on the living plants in the garden and sheets of dried specimens in the herbarium collection, using print to connect the collections through the Linnaean system.

Salton was replaced in 1794 by James Donn, who curated the garden until his death in 1813. Donn had trained with Aiton at Kew, further solidifying the links between the two institutions. In 1796 the trustees "agreed . . . that an application be made to the Syndics of the [University] Press to Print a Catalogue of the Botanic Garden & to allow the Gardener the Profits of the sale as an Encouragement

[126] Martyn, *Catalogus Horti Botanici Cantabrigiensis*, copy 3, at 175, Cory Library, Cambridge Botanic Garden.

[127] Martyn, *Catalogus Horti Botanici Cantabrigiensis*, copy 3, opposite 151, Cory Library, Cambridge Botanic Garden.

[128] *Cacalia hastrata*, 3 August 1779, Martyn Collection, CGE07158, CGE09029, Cambridge University Herbarium.

[129] Müller-Wille, "Names and Numbers," 119–20.

[130] [John Salton], *Horti Botanici Cantabrigiensis Catalogus* (Cambridge, 1794); Walters, *Shaping of Cambridge Botany*, 45.

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of his Diligence."[131] Later that year, Donn published the first edition of *Hortus Cantabrigiensis*, another list of species held in the garden, a book that went through seven editions in his lifetime.[132] Donn's *Hortus* sat somewhere between Martyn's *Catalogus* and Salton's *Horti Botanici*. Although he omitted descriptions, Donn did include information on species' preferred climatic conditions, geographical provenance, annual life cycles, medicinal applications, and seasonality and whether they were shrubs or trees.[133]

Donn solidified the relationship with Kew in the preface to *Hortus Cantabrigiensis*, dedicating the book "to the Hortus Kewensis of the late Mr. William Aiton, his excellent Master and one of the best Friends."[134] By the late 1790s, Kew and several nurseries near London and Newcastle were a main source of exotic species for the Cambridge Botanic Garden, with Donn acknowledging "his Majesty's Botanic Gardener at Kew" as supplying "many rare and curious Species" from across the empire. The numerous editions of *Hortus Cantabrigiensis* recorded the continuing influx of new material from Kew and various nurseries.[135] In editing these catalogues, Donn revised the arrangement of plants alongside changes to the Linnaean system, based on purchases of the most recent Linnaean systematic works. These included a copy of Johann Friedrich Gmelin's edition of Linnaeus's *Systema naturae*, its two volumes costing the university £1/10/0 in 1797, expenses Donn recorded in the garden's audit book.[136] By 1812, he was using the new edition of *Species plantarum* (1797–1818) edited by Carl Ludwig Willdenow (1765–1812), director of the Berlin Botanic Garden. In the preface to *Hortus Cantabrigiensis*, Donn noted, "In his arrangement the Editor has followed (except in a few instances) *Willdenow's Species Plantarum*, and has marked with an *asterisk* the Plants described in that work."[137] By the early nineteenth century, Willdenow's *Species plantarum* had become central to the process of communicating botanical knowledge between British botanical collections, connecting the Cambridge Botanic Garden with institutions such as Kew Gardens and the private collections administered by Banks.[138]

The production and annotation of catalogues embody the practices developed to cope with the continual accession of new species. The interleaved catalogues gathered

[131] "Rules, Orders, and Proceedings of Dr. Walker's Trustees," UA/Char.II.13, fol. 10, CUL.

[132] Walters, *Shaping of Cambridge Botany*, 45.

[133] James Donn, "Abbreviations," in *Hortus Cantabrigiensis: Or, A Catalogue of Plants, Indigenous and Foreign Cultivated in the Walkarian Botanic Garden, Cambridge* (Cambridge, 1796).

[134] Donn, *Hortus Cantabrigiensis* (1796), i.

[135] Donn, *Hortus Cantabrigiensis: or a Catalogue of Plants, Indigenous and Exotic, Cultivated in the Cambridge Botanic Garden*, 4th ed. (Cambridge, 1807), i.

[136] Audit Book, 1776–1828, UA/Misc.Collect.21, fols. for Michaelmas 1797, CUL.

[137] James Donn, *Hortus Cantabrigiensis; Or, A Catalogue of Plants Indigenous and Exotic*, 7th ed. (Cambridge, 1812), i.

[138] Edwin D. Rose, "From the South Seas to Soho Square: Joseph Banks's Library, Collection, and Kingdom of Natural History," *Notes and Records of the Royal Society* 73, no. 4 (2019): 499–526. For Willdenow, see Katrin Böhme and Staffan Müller-Wille, "'In der Jungfernheide hinterm Pulvermagazin frequens': Das Handexenplar des *Florae Berolinensis Prodromus* (1787) von Karl Ludwig Willdenow," *NTM Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin* 21, no. 1 (2013): 93–106. It should be noted that Donn's publication of numerous editions of *Hortus Cantabrigensis* worked in a similar manner to eighteenth-century library catalogues designed to encourage donations of books. See Basie Bales Gitlin, "'For the Encouragement of Benefactions': Library Catalogues and Fundraising in Colonial America," *Book Collector*, 74, no. 1 (2023): 63–78.

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information and provided codes to locate specific plants within the garden while linking these to published illustrations and herbarium specimens. The practice of keeping meticulous records was seen as a devotional activity, supplying evidence for the great chain of being—the notion that all matter was organized in a strict hierarchical structure.[139] Advanced systems for managing information made the collection navigable, giving those with access to the garden the opportunity to explore God's providential design.

ACCESS AND TEACHING

At the end of his *Short Account of the Late Donation of a Botanic Garden to the University of Cambridge*, Walker stated that the garden had been established "for the public Good."[140] However, the term *public* had very specific connotations in the 1760s. Although the garden was intended to benefit society through distributing knowledge of the extent and utility of God's creation to those attending botanical lectures, access to the institution itself remained limited. For much of the 1760s and 1770s, the only people who could access the garden were members of the university and colleges, the fifty or so students taking the botanical lecture course, and those who came supplied with letters of recommendation.[141] These access requirements mirrored those of many contemporary public institutions. Other institutional foundations in Cambridge included the "Public" or University Library, which had similar access rights.[142] In London, those wishing to visit the British Museum (which opened a year before the Cambridge Botanic Garden in 1759) had to make a request in writing to receive tickets, and once there were given a guided tour by one of the curators.[143] Consultations of its books and manuscripts were limited to the members of the learned societies and those who bore letters of recommendation addressed to the librarian.[144] In 1762, the museum employed Daniel Solander to design a Linnaean catalogue and open the natural history collection to the full range of British naturalists, although potential users were subjected to the same regulations as those wishing to use the library.[145]

Access to the Cambridge Botanic Garden was granted only to non-university members who provided letters of recommendation addressed to the professor of botany. Writing to Martyn in 1770, the physician Thomas Gery Cullum (1741–1831) requested that a "Mr Dixon, the Bearer of this letter," be shown around the garden, recommending Dixon as "one of the best Botanists." Visitors remained under the constant supervision of the professor or curator or sometimes both. Cullum specifically asked Martyn to "shew him [Dixon] the Greenhouse" and "if you have a few hours leisure to walk about the Garden, you will be a better judge

[139] See Simon Schaffer, "Lovejoy's Series," *History of Science* 48, nos. 3–4 (2010), 483–94.

[140] Walker, *A Short Account*, 6.

[141] For students attending Martyn's early lectures, see Walters, *Shaping of Cambridge Botany*, 43.

[142] David McKitterick, *Cambridge University Library: A History*, vol. 2, *The Eighteenth and Nineteenth Centuries* (Cambridge, 1986), 343.

[143] Rose, "Specimens, Slips, and Systems," 216.

[144] Anne Goldgar, "The British Museum and the Virtual Representation of Culture in the Eighteenth Century," *Albion* 32, no. 2 (2000): 195–231.

[145] Rose, "Specimens, Slips, and Systems," 215–16.

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of his articles than I am."[146] Dixon's need to present this letter reflects the garden's limited accessibility in the 1760s and 1770s, when Martyn treated the garden, library, and museum in a manner similar to that of owners of private botanic gardens and natural history collections.

Martyn believed that private collections were at the pinnacle of British natural history during this period. In his *Elements of Natural History* (1775), he maintained, "Men of rank and fortune have the advancement of knowledge more such in their power than the mere Scholar. The science therefore of natural history is peculiarly fortunate in possessing two such men as Mr Pennant and Mr Banks; whose abilities and Industry prompt them to make use of these fortuitous advantages."[147] Martyn's confidence in the powerful networks of private collectors encouraged the integration of the botanic garden with global collecting enterprises administered by Banks and the zoologist Thomas Pennant (1726–1798). Martyn emulated practices common in private collections through his management of the garden, developing the institution through his private network and using books from his personal library. His connections with private collectors encouraged the accumulation of species from across these global collecting enterprises.

Martyn's interest in running the Cambridge Botanic Garden along similar lines to a private collection is reflected in his distribution of the *Catalogus*. Copies found their way only into the hands of Martyn's correspondents, students, and Cambridge college libraries.[148] In a letter to Pulteney, Martyn emphasized that the *Catalogus* was not produced for general sale but was "intended wholly for the use of my pupils," adding that the only other recipients were a few select friends.[149] The *Catalogus* was a private commission, financed by Martyn through donations to the garden, student fees, and subscriptions paid by Cambridge and London booksellers. Its mode of publication is representative of the private work undertaken by John Archdeacon, the printer for Cambridge University Press between 1766 and 1793, much of whose commissions consisted of pamphlets and books printed for university members.[150] Martyn's *Catalogus* represents a distinct form of genteel publishing that dominated late eighteenth-century natural history, with copies distributed only to a select group.[151] Martyn's publishing practices bonded a specific network developed through the selective distribution of other books such as *Plantæ Cantabrigienses* (1763). The first Linnaean account of the flora of Cambridgeshire, Martyn's *Plantæ* was presented only to attendees of the botanical expeditions associated with his lectures.[152]

For the first two decades of the garden's existence, Martyn ran it in a manner similar manner to that of a genteel natural history collector, gaining the trust of the numerous private collectors with the means to supply specimens and living

[146] Thomas Gery Cullum to Martyn, 29 September 1770, MSS BANKS COLL MAR, fol. 359, NHM.
[147] Thomas Martyn, dedication to *Elements of Natural History* (Cambridge, 1775).
[148] Martyn to Pulteney, 17 February 1772, MS/2380/28/20, LSL.
[149] Martyn to Pulteney, 17 February 1772, MS/2380/28/20, LSL.
[150] David McKitterick, *A History of Cambridge University Press*, vol. 2, *Scholarship and Commerce, 1698–1872* (Cambridge, 1998), 226.
[151] Edwin D. Rose, "Publishing Nature in the Age of Revolutions: Joseph Banks, Georg Forster, and the Plants of the Pacific," *Historical Journal* 63, no. 5 (2020): 1132–59.
[152] Thomas Martyn, *Plantæ Cantabrigiensis* [. . .] (Cambridge, 1763).

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plants from across already advanced global networks. However, in comparison to private collections—which Walker suggested "lasted no longer than the Collectors" due to "a want of public reception"—the Cambridge garden's longevity was assured through its connection to the university.[153] Its use in teaching defined the garden as a "public" institution, its mission ultimately to benefit the "public good."[154] In the early 1780s, however, its private nature began to change, owing to increased interest from students. In 1782 Martyn wrote to John Strange (1732–1799), the British envoy in Venice whom he had met during a grand tour commenced between 1779 and 1781, describing how natural history "gains ground at Cambridge and it will be hard indeed, if out of thirty, or thereabouts, whose curiosity is annually excited; one or two may not be found to follow it up, & make something of it. In our time, you know, it was a study scarce heard of among us; we were looked upon as no better than cockle-shell pickers, butterfly hunters and weed gatherers."[155] The surge in interest Martyn witnessed in those wishing to take the botanical course was a drive that occurred more generally across British society after Cook's voyages, the popularization of the Linnaean system, and the rise of natural theology.

After Martyn's return to Cambridge following his grand tour, his course of botanical lectures became more popular. He added a range of specimens to the botanical museum and issued university notices advertising tours of the collection: "Mr. Martyn usually spends the morning in the Museum; and will be ready to give any previous information to those who design to attend his Lectures; as well as to exhibit the Specimens of Natural History, which he has collected in both Switzerland and Italy, both to his Pupils, and to such as have not leisure to go through his course."[156] Martyn had collected specimens as he traveled through France, Switzerland, and the Italian states in the company of his family and a student.[157] He wrote to Pulteney, "I made a copious Hortus Siccus; collected a great variety of fossils; and sent over a large case of rare Alpine plants to the Botanic Garden at Cambridge."[158] Although his route was conventional (with the exception of the extended period in Switzerland), a main purpose was to collect natural history specimens.[159] In comparison, other "grand tourists" tended to collect antiquities or renaissance artworks or commission baroque sculptures.[160]

Martyn publicized his journeys in a *Sketch of a Tour through Swisserland* (1787) and *A Tour through Italy* (1791).[161] In these two published accounts, Martyn described the process of collecting specimens in the Swiss valley of Grindelwald and his visits to numerous university botanic gardens. Visiting the University of Padua's botanic garden, he described it as "a very good one, and . . . arranged according to

[153] Walker, *A Short Account*, i.
[154] Walker, 6.
[155] Martyn to John Strange, 8 April 1782, Egerton MS 1970, fols. 80r–80v, British Library.
[156] "University Notices," vol. 1, UA/UP 1-1*, fol. 76, CUL.
[157] Gorham, *Memoirs of John Martyn*, 150.
[158] Martyn to Pulteney, 6 April 1781, as quoted in Gorham, *Memoirs of John Martyn*, 157.
[159] Jeremy Black, *The British and the Grand Tour* (London, 1985), 12–50.
[160] Jeremy Black, *Italy and the Grand Tour* (New Haven, 2003), 47.
[161] Thomas Martyn, *Sketch of a Tour through Swisserland* [. . .] (London, 1787); Thomas Martyn, *A Tour through Italy* [. . .] (London, 1791).

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the system of Tournefort."[162] He combined visits to botanic gardens with examinations of museums of art and antiquities, making contacts with fellow collectors with similar interests, including Strange in Venice, who facilitated the acquisition of natural history specimens and associated artworks. After Martyn's return to England, Strange wrote that he had acquired for him "one of [Giambattista] Pittoni's very best Pictures" depicting "the Presepio; with the Madonna & child St Joseph & angels."[163] Martyn intended this fine baroque painting to serve as an altarpiece in the newly renovated chapel of Sidney Sussex College.[164] Exchanges with figures such as Strange and botanical curators established the garden in a broader European network.

The use of the Linnaean system further increased access for students, botanists, and general groups. By the 1780s, the Linnaean arrangement of the garden was advertised in Cambridge guidebooks that could be purchased from local booksellers such as Deighton Bell and Merrill.[165] By 1785, one guidebook noted that the "whole garden is accurately arranged according to the system of the celebrated Linnæus, and a catalogue of all the plants has been published."[166] In addition to fulfilling the various theological interests of Cambridge professors, the Linnaean system made the collections more accessible to a general audience, as Martyn was well aware. He advised readers of his *Letters on the Elements of Botany* (1785), designed to be sold to a broad literate audience, that "the works of Linnæus alone will furnish you with all the knowledge you have occasion for."[167]

By 1784, the museum had grown to such an extent that the original building was no longer sufficient to house the collection, and the university syndics agreed "to erect a Botanical & Chemical lecture room . . . the piece of Ground at the South East Corner of the Bot. Garden is a proper spot."[168] The new building provided more space for formal lectures as student numbers increased, and housed the botanical museum and library, an aspect of the collection Martyn had given more attention since John Salton's appointment as curator of the main garden in 1778.[169] Martyn wrote to Pulteney in 1783 that he had been "obliged to catalogue, arrange & pack up all my Museum; on account of the University pulling down my house."[170] Shortly after the demolition, the old mansion house was leased to the banker John Mortlock for £150, solving many of the Botanic Garden's financial problems. The new lecture room formalized the teaching of botany within the university framework, defining a site for the botanical museum and classes. It also brought the museum into the botanic garden, as it was now necessary to walk through the garden to attend lectures and view Martyn's collection.

[162] Martyn, *Tour through Italy*, 414.

[163] John Strange to Martyn, 24 July 1783, MR. 112/1/2, Sidney Sussex College.

[164] Martyn to William Elliston, 26 August 1784, MR. 112/1/2, Sidney Sussex College.

[165] See Jonathan R. Topham, "Two Centuries of Cambridge Publishing and Bookselling: A Brief History of Deighton, Bell, and Co., 1778–1998, with a Checklist of the Archive," *Transactions of the Cambridge Bibliographical Society* 11, no. 3 (1998): 350–403.

[166] *A Concise and Accurate Description of the University, Town, and County of Cambridge* (Cambridge, 1785), 16.

[167] Martyn, *Elements of Botany*, xi.

[168] "Liber Gratiarum Lambda, 1772–1809," UA/Grace Book Lambda, 1772–1809, fol. 71, CUL.

[169] "Rules, Orders, and Proceedings of Dr. Walker's Trustees," UA/Char. II. 13, fol. 6v, CUL.

[170] Martyn to Pulteney, 30 July 1783, Cory Library, Cambridge Botanic Garden. I thank Caroline Murray for alerting me to this letter.

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Under the curatorship of James Donn in the 1790s, the botanic garden became more accessible. By 1804, Cambridge guidebooks outlined a few choice species that visitors could view: "Adjoining [the garden] is a Hot-house, furnished with stoves for preserving exotics, on the most improved construction. Among the exotics are a variety of singular trees and plants from New Holland; some tea, coffee, and breadfruit trees; a cotton tree, and many others of equal curiosity and value."[171] This detailed description implies that possessors of the Cambridge guidebook could visit the garden and examine individual species in detail. Further evidence for this is apparent from the successive editions of Donn's *Hortus Cantabrigiensis*, first published by Cambridge University Press in 1796. Donn designed this volume "for the use of those Students in Botany who shall be disposed to inspect the productions of the WALKERIAN GARDEN," adding that it was his intention "to satisfy the expectation of the Gentlemen of the University."[172] Although the first edition was produced only for students and members of the university, the readership expanded with every new edition. By 1807, Donn noted that the "former Edition of this Catalogue, published in the Year 1804, was so rapidly sold out (the demand for it being so exceedingly great) it became necessary to reprint it."[173] Donn privately funded the production of new editions because of the strain it placed on Cambridge University Press, and by 1812 he noted that *Hortus Cantabrigiensis* "will be useful to the *Public* and acceptable."[174] The rapid sales reflect its distribution to those visiting the garden. Martyn had ceased lecturing late in the 1790s and now seldom visited Cambridge, but it was still possible to receive a tour from the curator, during which students and visitors had the opportunity to acquire a copy of *Hortus Cantabrigiensis* "sold by James Donn, Curator, at the Botanic Garden."[175] Throughout the 1810s and 1820s, many members of the reading public who visited the garden purchased *Hortus Cantabrigiensis* at the door and used it as a Linnaean guidebook.

CONCLUSIONS

Religion remained central to Martyn's life and formed a key reason for his choice to retire from the public eye around 1800. He described this step as "a providential one for me; and I humbly hope has proved a blessing to me, under Divine Grace, by weaning me from the world."[176] From the 1760s, Martyn had continued Walker's theological design in developing the garden, working alongside the successive curators Miller, Salton, Donn, and Biggs to build a collection to cast light on the extent of God's creation. This theological focus initiated a very different set of collecting priorities compared to other institutional and private collections that sought to source, describe, and test the capabilities of new species for their economic, medical, and agricultural potential. Rather, the mutual compatibility of Anglican theology and

[171] *The New Cambridge Guide; Or a Description of the University, Town and County of Cambridge* (Cambridge, 1804), 10.
[172] Donn, *Hortus Cantabrigiensis* (1796), i–ii.
[173] Donn, *Hortus Cantabrigiensis* (1807), i.
[174] Donn, *Hortus Cantabrigiensis* (1812), vii.
[175] Donn, title page to *Hortus Cantabrigiensis* (1812).
[176] Gorham, *Memoirs of John Martyn*, 262.

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the Linnaean system initiated a program of collecting, classifying, and publishing designed to show the extent of God's providence in the plant kingdom in Cambridge.

Theological interests created a very different set of motivations for connecting the university to imperial collecting enterprises when compared to other contemporary foundations. Martyn aimed to acquire living and preserved examples of plants and to subject these to Linnaean classification. The garden's collecting shifted alongside British imperial interests and those of university members. After the American Revolution, the emphasis of collecting moved from the Americas to Europe, Asia, and Oceania, particularly Sumatra, India, Van Diemen's Land, and the Levant. As the decades progressed, collecting became more formalized into the university's administrative frameworks, moving out of Martyn's private correspondence and into audit books kept by the curators. The rapid acquisition of botanical species necessitated the development of advanced "paper technologies" to manage information. Although copies of Linnaeus's *Systema naturae* and Miller's *Gardeners Dictionary* had been sufficient to organize the collection in the 1760s, it soon became essential to publish catalogues of the garden's holdings. These were adapted to accommodate the acquisition of new species, as evidenced by Martyn's interleaved copy of the *Catalogus*, integrating philosophical aspects of the Linnaean system with details on a plant's location within the garden. Catalogues linked chains of references allowing the professor, curator, and students to cross-reference living plants with dried specimens and archetypal illustrations. The limited distribution of the early catalogues reflects the closed nature of the garden that was then accessible only to university members and to students attending botanical lectures, a situation that changed in the early nineteenth century when the collection became more accessible to the literate classes.

From around 1810, Martyn had attempted to resign on several occasions. His death in June 1825 triggered an election for the botanical professorship, and John Stevens Henslow, then professor of minerology, was elected to the post.[177] Henslow favored the "natural systems" of classification devised by the Swiss naturalist Augustin Pyramus de Candolle (1778–1841), which placed more emphasis on geographical provenance and a greater variety of physical characters of species than did the Linnaean system.[178] As such, early nineteenth-century botanists were dismissive of Martyn's design of the Cambridge Botanic Garden, seeking to replace the Linnaean understanding of nature. A different systematic approach combined with the continued acquisition of plants created a crisis of space, necessitating the transfer of the botanic garden to its current location in 1846.[179]

Formal lectures resumed after Henslow's appointment. In 1828, he recorded seventy-one fee-paying students, numbers that remained consistent until the mid-1830s.[180] The use of the botanic garden as a teaching collection implies its public utility. In addition to the garden becoming "public," the professorship was regarded as a public appointment: when Henslow was appointed to the post in 1825, the

[177] "Professor of Botany, 1724–1973," UA/CUR 39.16-39.1, fols. 4–5, CUL.

[178] For "natural systems," see Thierry Houquet, "Botanical Authority: Benjamin Delessert's Collections between Travelers and Candolle's Natural Method (1803–1847)," *Isis* 105, no. 3 (2014): 508–39.

[179] John S. Henslow, *Address to the Members of the University of Cambridge* [. . .] (Cambridge, 1846); John Stevens Henslow, *A Catalogue of British Plants Arranged According to the Natural System* [. . .] (Cambridge, 1829).

[180] Names of Men who Attended the Botanical Lectures, UA/O.XIV.261, verso of first endpaper, CUL.

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official notice released on 26 July referred to him as "our public Professor and reader of botany."[181] The marked popularity of Henslow's lectures came as a direct consequence of an upsurge of interest in natural theology that ensured the garden and its associated teaching program retained its relevance to students, recent graduates, and fellows of the university.[182] Charles Darwin enrolled in the botanical lecture course between 1829 and 1831, later remarking that Henslow's teachings "influenced my career more than any other."[183] Natural theology was central to Henslow's botanical lectures that sought to understand the questions raised in popular texts such as William Paley's *Natural Theology* (1802), in which Paley stressed, "There is no subject in Which the tendency to dwell upon select or single topics is so usual, because there is no subject, of which, in its full extent, the latitude is so great, as that of natural history applied to proof of an intelligent creator."[184]

[181] As quoted in S. M. Walters and E. A. Stow, *Darwin's Mentor: John Steven's Henslow, 1796–1861* (Cambridge, 2001), 52.
[182] Fyfe, "Reception of William Paley's Natural Theology," 329.
[183] John Van Wyhe, *Darwin in Cambridge*, 76–77.
[184] William Paley, *Natural Theology*, ed. Matthew D. Eddy and David Knight (Oxford, 2006), 279.

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