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CULTURAL AND HISTORICAL GEOGRAPHIES OF THE ARBORETUM

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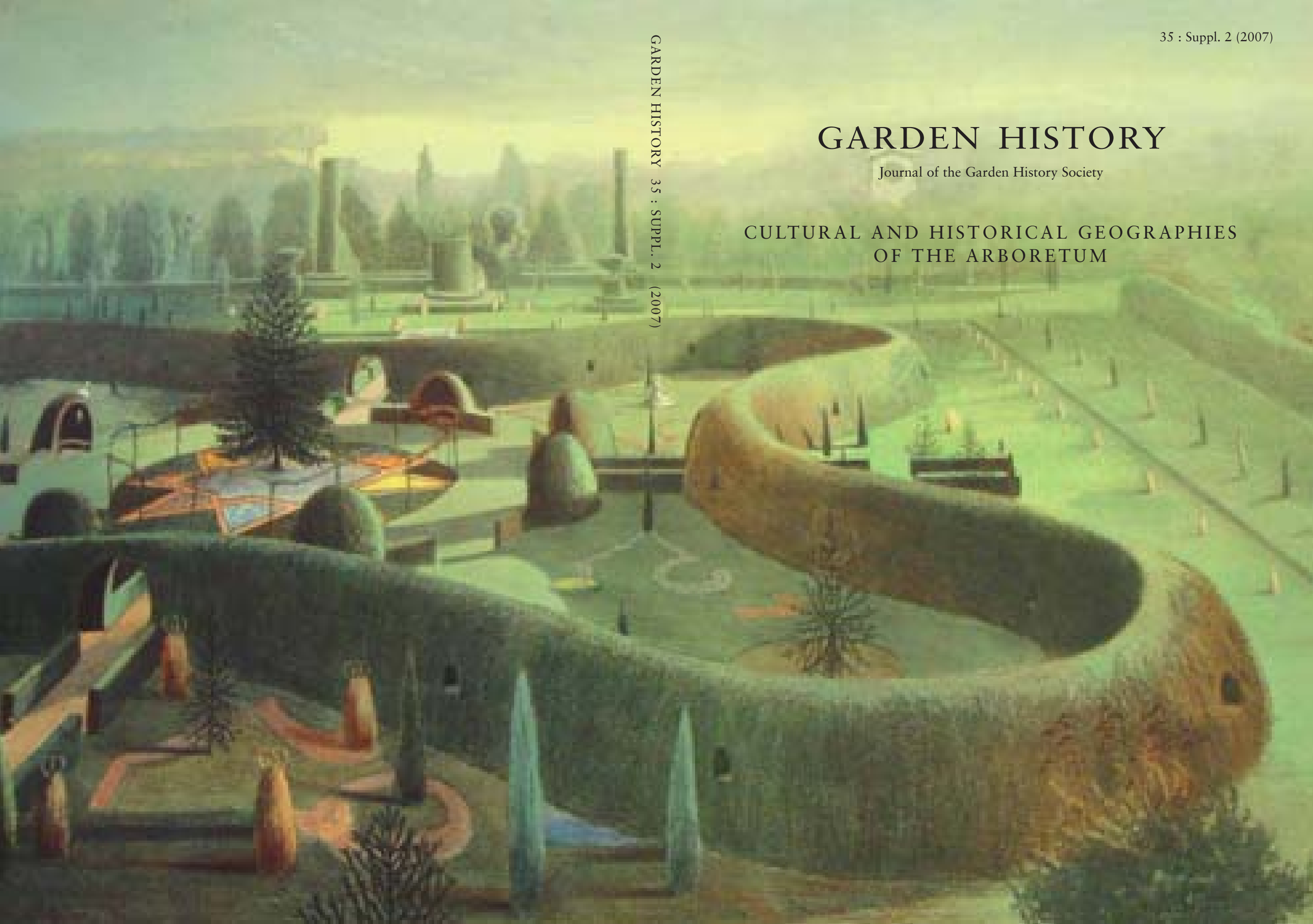

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CULTURAL AND HISTORICAL GEOGRAPHIES OF THE ARBORETUM

GUEST EDITED BY

PAUL ELLIOTT, CHARLES WATKINS AND STEPHEN DANIELS

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THE GARDEN HISTORY SOCIETY was founded in 1965 to bring together all those interested in garden history in its various aspects – garden and landscape design and their relation to architecture, art, literature, philosophy and society; plant introduction, propagation and taxonomy; estate and woodland planning and maintenance; and other related subjects. Contributions on these subjects for inclusion in future issues of *Garden History* should be sent to the Editor, Dr Barbara Simms

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e-mail: ghsmembership@lavenhamgroup.co.uk

Correspondence concerning *Garden History* should be addressed to the Editor:
Dr Barbara Simms, 33 Lion Court, 12 Shand Street, Bermondsey,
London SE1 2EP, UK; e-mail: journal@gardentales.co.uk

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View of the gardens at Elvaston Castle, Derbyshire, looking towards the pinetum; from E. Adveno Brooke, *The Gardens of England* (London: T. McLean, 1857).
Courtesy: Derby Local Studies Library, Irongate, Derby
(See also the lower image on the thirteenth page of the colour section.)

EDITORIAL

Since it was established in 1965, the Garden History Society has provided the academic background as well as the impetus for the conservation of historic gardens. At the first Conservation Conference in 1968, Frank Clark, President of the Society, emphasized the importance of continuing the traditions of the great gardens: 'variety of visual experience, forms that are rich in association, forms that are expressions of the richness and complexity of nature, forms that allow the processes of life to go on'.[1] With these traditions, however, comes the responsibility to protect historic gardens, not just for the owners, but for government and amenity societies. The Society's active conservation role has been increasingly recognized since that time and it is consulted on proposed changes to all sites on the English Heritage *Register of Parks and Gardens of Special Historic Interest in England*. Conservation of ephemeral plants and trees is, perhaps, less straightforward than other design elements but, nonetheless, they are as important to the understanding of a garden's historic significance. Trees, in particular, whether in hedges, avenues, arboretums, woods or as individual specimens, are part of the managed designed landscape, as emphasized in an essential reference tool, the recently published *The Management and Maintenance of Historic Parks, Gardens and Landscapes* by John Watkins and Tom Wright.[2]

A study of 'plant introductions, propagation and taxonomy; estate and woodland planning and maintenance' is also key to the Society's remit and, thus, to the theoretical rationale for *Garden History*. Earlier issues featured papers on the cost of shrubs and trees in 1754 (John Harvey, 2/1, 1974), seventeenth-century cedars (P. J. Jarvis, 4/2, 1976), the trees and shrubs of Fulham Palace Gardens, 1675–1713 (Sandra Morris, 19/1, 1991) and avenue planting in the seventeenth and eighteenth centuries (Sarah Couch, 20/2, 1992), to name a few. This second supplementary issue of *Garden History* is dedicated to the scholarly proceedings of a conference on tree collections held in September 2006 at London's Linnean Society. Funded by the Arts and Humanities Research Council, the proceedings are guest edited by Paul Elliott, Charles Watkins and Stephen Daniels of the University of Nottingham and represent the culmination of a three-year project on the cultural and historical geographies of arboretums. Thanks are particularly due to Paul Elliott, who has undertaken, with efficiency, good humour and fortitude, the editorial work on the papers in this special issue. Although focusing on the history of the British arboretum, the papers also include insightful and detailed analyses of North American and Australian arboreta and they raise issues concerning the design, restoration and management of contemporary tree collections. The Garden History Society is, therefore, delighted to assist in the dissemination of 'Cultural and Historical Geographies of the Arboretum', a body of work that will be a rich source of knowledge for present and future scholars.

BARBARA SIMMS

REFERENCES

[1] Geoffrey Jellicoe, Susan Jellicoe, Patrick Goode and Michael Lancaster (eds), *The Oxford Companion to Gardens* (Oxford: Oxford University Press 1986), p. 126.

[2] John Watkins and Thomas Wright, *The Management and Maintenance of Historic Parks, Gardens and Landscapes. The English Heritage Handbook* (London: Frances Lincoln, 2007).

PREFACE

This special issue of *Garden History* on the subject of arboretums is one of the principal outputs of a major project on the cultural and historical geographies of arboretums undertaken by the School of Geography, Nottingham University, Nottingham, 2004–07. This was directed by Charles Watkins and Stephen Daniels; the research was undertaken by Paul Elliott; and the funding was provided by the Arts and Humanities Research Council (AHRC) (RA1526/39). Most of the papers in this special issue result from an international conference that took place at the Linnean Society of London, Burlington House, London, 6–8 September 2006. We would like to thank the AHRC for funding the project and conference, including providing financial assistance to speakers for accommodation and travel expenses; and funding the production of this special issue of *Garden History*.

The conference included a special visit to St James's Park, London, for a tour led by Mark Wasilewski, Manager of St James's Park and Green Park. There was also an excursion to Abney Park Arboretum Cemetery in Stoke Newington, North London, guided by members of staff from the Cemetery Trust. We would also like to express our appreciation to the audience and participants at the conference, especially all those who delivered papers: Max Bourke, Tom Schlereth, Beryl Hartley, Brent Elliott, Owain Jones, Nuala Johnson, Divya Tolia-Kelly, Simon Naylor, Chris Harris, David Whitehead, Sophie Piebenga and Simon Toomer. We are also grateful to Finola O'Kane for contributing a paper on modern Irish arboretums and to Susanne Seymour for considerable help and support. Finally, special thanks are due to Barbara Simms and Cristiano Ratti of *Garden History* for their patience and dedication in putting this special issue together.

The project grew originally from Elliott's work on the Derby Arboretum (1840), Watkins's studies of the cultural history of trees, woodland and forestry, and Daniels's examination of the cultural significance of trees in late Georgian society and, more generally, the iconography of landscape. It was motivated primarily by recent work in the history of science and attention to space in social and cultural theory. The project explored the historical and cultural geographies of nineteenth-century English tree collections and arboreta. The primary aims were to examine the philosophical, aesthetic, horticultural, and educational theories underpinning their design, and the management and consumption of tree collections, particularly the tension between naturalistic and geometric aesthetics and botanical taxonomies, and this is reflected in the papers in this issue. The links with botanical gardens, the horticultural trade and the scientific development of forestry are also considered, as is the role of international networks, exploration, trade, and imperialism in tree collecting. Collectively, the papers trace the interconnections between horticulture, botany and forestry, the role of institutions, and the relationships between arboretums and their various social, cultural, and institutional contexts. Although the principal focus is arboretums in the British Isles, the issue includes work on North American and Australian arboreta and, whilst the focus is primarily historical, some papers also address questions concerning the design, restoration, and management of contemporary tree collections. On the exacting question of whether the plural of arboretum should be arboretums or arboreta, we have decided that they can be used interchangeably.

The first paper by Paul Elliott, Charles Watkins and Stephen Daniels explores the cultural and historical geographies of arboretums including the sometimes complex relationships between written textual and planted arboretums, the tensions between botanical taxonomies and aesthetics, and the variety of designs, management, consumption, experiences, and appropriations of arboretums. It has been surprisingly difficult to determine exactly when the term 'arboretum' was first applied to planted tree collections, largely because many collections and plantations were subsequently labelled as arboretums, especially by John Claudius Loudon. Loudon's interpretation of the subject has tended to predominate from the nineteenth century onwards, principally because of his success as a writer and promoter and the publication of his monumental *Arboretum et Fruticetum Britannicum* (London, 1838). Yet, as we demonstrate, other individuals before and after Loudon were promoting sometimes strikingly different conceptions of arboretums.

Subsequent papers consider the varied development of arboretums in the countries of the British Isles. Beryl Hartley examines Loudon's role in promoting his conception of an arboretum, especially through the *Arboretum et Fruticetum* with its four volumes of tree portraits, and the relationships between the book and important commissions such as the Derby Arboretum (1840). She also considers why, in her view, many Victorian arboretums failed to live up to Loudon's model. Nuala Johnson explores the systems of nomenclature, labelling and planting at Glasnevin Botanic Gardens, Dublin, which seems to have contained the first planted tree and shrub collection designated as an arboretum. Johnson emphasizes that although taxonomic regulation and labelling provided the primary motivation for the design and management of the garden, questions of elegance, ornament, rarity, and beauty were also important. Similarly, Brent Elliott shows how the impulse to collect, the desire to represent botanical taxonomies, and aesthetic delight variously motivated the development of arboretums during the nineteenth and twentieth centuries. He also considers how the introduction of exotic species came to be opposed from the late nineteenth century, principally by architects such as Reginald Blomfield rather than by gardeners.

Simon Naylor's study of Elizabeth Warren and the Royal Cornwall Horticultural Society's *Hortus Siccus* of the Indigenous Plants of Cornwall reminds us that despite the focus on living arboretums and tree collections here, dried collections, published works, and botanical networks remained of crucial importance during the nineteenth century for botanical education, classification, and collecting. In examining the rise and demise of a regional botanical mapping project, the paper also reflects upon the importance of the changing relationships between regional, provincial, and amateur scientific communities, and their metropolitan counterparts.

David Whitehead, Sophie Piebenga and Simon Toomer, and Elliott, Watkins and Daniels examine in different ways the economic, cultural, and scientific significance of estate arboretums and tree collections. Together, these studies show how, whilst retaining an interest in taxonomies and the accumulation of exotics, the Stanhope Scudamores at Holme Lacey, Herefordshire, the Holfords at Westonbirt, Gloucestershire, and William Barron and the Stanhopes at Elvaston, Derbyshire, developed arboretums and tree collections that were planted primarily according to interpretations of picturesque landscape gardening theories and practices. Barron and the Stanhopes and the Scudamores at Holme Lacey created collections of exotics upon Georgian landscaped parks, transforming picturesque plantations into what were, in effect, artistically treated arboretums. Information concerning their design and management became public through visits from gardeners, journalists and others, and the public, and through the widespread

circulation of descriptions in the gardening and horticultural literature. Although these estate arboretums were private creations conceived and managed for the enjoyment of wealthy families, they were part of extensive estate economies. These considerations have helped to shape the subsequent management of these collections, especially at Westonbirt, which has been transformed since the 1950s under the Forestry Commission into a very popular national arboretum.

Arboretums also provided an important model for public parks and gardens during the nineteenth century and had an impact on the garden cemetery 'movement' promoted by Loudon and others. As Owain Jones emphasizes in his study of Arnos Vale Cemetery, Bristol, and Elliott, Watkins and Daniels show in their analysis of Barron's use of evergreens, they encouraged greater attention to the selection and planting of trees and shrubs in cemeteries. Although the promotion of these schemes was important, Jones emphasizes the importance of appreciating the combined roles of vegetable as well as human agencies in determining the shifting character of cemeteries in the context of material urban places and complex cultural contexts.

Divya Tolia-Kelly and Finola O'Kane reflect on the political significance of tree collections and arboretums during the twentieth and twenty-first centuries. O'Kane's essay contrasts with Johnson's study of Glasnevin in emphasizing the importance of arboretums in terms of Irish nationalism. She argues that reflecting the significance of trees in Irish mythology and culture and the intertwined mixture of landscape, education, nationalism, politics and memory, arboretums of the nineteenth and twentieth centuries were appropriated for nationalistic expression, although they continued to represent different histories. Irish arboretums have, therefore, been major embodiments of the constant struggle between images of nature, educational values and political ideas that have helped to shape modern Irish cultural identities. Tolia-Kelly demonstrates how, rather than being appropriated by one particular political or nationalistic group, the microcosmic cosmopolitan nature of arboretums can also provide important sources of community identity and integration. The Burnley Millennium Arboretum provides an example of organic cosmopolitanism in a modern, British, urban, multicultural environment, whilst also challenging conceptions of Britishness, just as nineteenth-century public arboretums provided the means through which many exotic trees and shrubs were introduced into Britain, an important link between the countries within the Empire and simultaneous assertions of various identities.

The final papers develop the theme of arboretums in the USA and Australia. Tom Schlereth explores the development of American arboretums during the first half of the nineteenth century which was stimulated by the impact of British and European horticultural practices and transnational exchanges of trees and shrubs. He emphasizes the importance of publications and individuals, institutional collections, tensions between private and institutional ownership, and the management of public access. In his analysis of Australian arboretums, Max Bourke contends that arboretums and other plant-introduction systems provided a framework for a study of the history of science and especially ecology, becoming foci for the networks of plant exchange and experimentation. He argues that the development of plantation economies provided the principal motivation for the creation of arboretums whilst also emphasizing the political significance of arboretums and the relationship between the establishment of collections and notions of territorial possession and ownership.

Together, in their analysis of the cultural and historical geographies of arboreta and tree collections, these papers allow us to compare the varying intentions of promoters, the design, management, consumption and meanings of arboretums. They demonstrate

the role of botanical taxonomies, education and institutions, forestry, the horticultural trade, exploration and imperialism, international networks, and other factors in the creation of modern arboretums. However, they also underscore the distortions inherent in interpreting arboretums according to each of these factors in isolation. Despite the ecological devastation that certain plant introductions have unwittingly wrought, it is too simple to dismiss or condemn them, for instance, merely as nationalistic, imperialistic or Western institutions, when they frequently came to embody so much more. In tracing the cultural significance of arboretums and interconnections between social, cultural and institutional contexts, this special issue of *Garden History* demonstrates that arboretums are one of the most significant and fertile forms to have emerged in modern global horticulture and gardening.

PAUL ELLIOTT, CHARLES WATKINS AND STEPHEN DANIELS

PAUL ELLIOTT, CHARLES WATKINS AND STEPHEN DANIELS

'COMBINING SCIENCE WITH RECREATION AND PLEASURE': CULTURAL GEOGRAPHIES OF NINETEENTH-CENTURY ARBORETUMS

Arboretums were innovative and important developments in British and, ultimately, global landscape gardening during the eighteenth and nineteenth centuries. Inspired by British and European traditions of landscape gardening, horticulture, agricultural improvement and botany, they were imbued with symbolism and meaning according to the circumstances of their creation, character and usage. For some nineteenth-century landscape gardeners and horticulturists they offered global excursions in microcosm, providing rational recreation, aesthetic enjoyment and botanical experimentation. Their systematic planting promoted an image of rational, objective science and appropriate behavioural responses, helping to differentiate and shape Victorian middle-class identity. However, the complex relationships between designs, management, botanical displays, organic agencies, and consumption ensured contested and contingent responses and appropriations.

> He faced, across half an acre of lawn, what the previous owners had called their 'arboretum'. Ludovic thought of it merely as 'the trees'. Some were deciduous and had now been stripped bare by the east wind that blew from the sea, leaving the holm oaks, yews, and conifers in carefully contrived patterns, glaucous, golden and of a green so deep as to be almost black at that sunless noon.[1]

By the mid-twentieth century the term 'arboretum' was relatively commonplace. It referred to a place where collections of trees were grown and displayed systematically, sometimes planted according to botanical taxonomies, labelled and catalogued. For some, such as Evelyn Waugh, the term had become hackneyed; the quotation above describes an arboretum in the garden of a 'large, requisitioned villa in a still desolate area of Essex', in 1943. Here the term is consciously pompous and affected, describing the remnant of a small tree collection in the garden of a modest villa. This paper examines the rather complicated, and to some extent mysterious, origins of arboretums in the British Isles and focuses on the varied forms they took in the nineteenth century.

Arboretums as places for the cultivation and display of a wide variety of both deciduous and coniferous trees developed during the late eighteenth and early nineteenth centuries. They were a combination of plantation, which usually consisted of a few varieties of trees, and botanical garden. They represent a powerful arboricultural version of the Edenic myth, the life-affirming narrative of rekindling Platonic order and perfection in an imperfect world, or a precious botanical ark preserving the essence of nature through the stormy vicissitudes of time.[2] The arboretum idea was always intimately related to written

School of Geography, University of Nottingham, University Park, Nottingham NG7 2RD, UK

textual manifestations from which it had arisen. John Claudius Loudon's *Arboretum et Fruticetum Britannicum* (London, 1838), with its wealth of drawings and information, was only the most famous of a series of works that were, in effect, virtual page-bound arboretums, but which were based upon detailed observations of trees and collections in specific places (Plate I).[3]

Some arboricultural works were descriptive regional studies, such as James Grigor's *The Eastern Arboretum* … (London, 1841) of Norfolk trees and lavish, celebratory Victorian and Edwardian surveys such as Edward Ravenscroft's *The Pinetum Britannicum* (Edinburgh, 1863–84), Henry Elwes and Augustine Henry's *The Trees of Great Britain and Ireland* (Edinburgh, 1906–13), and William Bean's *Trees and Shrubs* … (London, 1914).[4] In other cases specific collections served as the inspiration for published arboricultural works such as those concerning Woburn, Westonbirt and Bayfordbury.[5] Other studies, intended as comprehensive national or international surveys, drew their material primarily from one arboretum, which they also helped to promote, such as nursery company James Veitch and Son's *Manual of the Coniferae* (London, 1881) and, on a larger scale, Charles Sprague Sargent's *The Silva of North America* (New York, 1891–1902), much of the information being obtained from the Arnold Arboretum, Boston, where he was the Director.[6] Finally, more complex symbiotic relationships have pertained between written texts and particular arboretums, the former sometimes never fully representing how the latter ever were or came to be.

Arboretums became especially popular from the 1830s as an ideal form for larger private and public gardens, estate parks and botanical gardens. Although the publication of the *Arboretum et Fruticetum* and Loudon's other voluminous gardening works have ensured that he is primarily associated with the concept in the period, other gardeners and landscape gardeners were promoting the idea during the first decades of the century, including his wife Jane.[7] In one of his final commissions between 1813 and 1815, Humphry Repton included an arboretum of exotic trees alongside a pomarium, rosarium and other features in an eclectic design for the gardens at Ashridge Park, Hertfordshire.[8] George Sinclair, head gardener at the Duke of Bedford's Woburn Abbey seat, under the auspices of the Society for the Diffusion of Useful Knowledge, enthusiastically recommended their widespread introduction. For Sinclair, the 'interest arising from the adoption of foreign trees into domestic scenery' was 'not confined to their picturesque effects', but reminded all 'of the climes whence they come' and the 'scenes with which they were associated'. In exploring 'a well-selected arboretum', the:

> eternal snows of the Himalaya, the savannahs of the Missouri, the untrodden forests of Patagonia, the vallies of Lebanon, pass in review before us: we seem to wander in other climes, to converse with other nations.[9]

The popularity and fashionableness of tree collecting, encouraged by the important cultural status of trees in British myth, culture and society, estate economy and changing fashions in landscape gardening, especially the decline of formalism and advent of picturesque naturalism, made the acquisition of novel tree and shrub specimens, like works of art or antiquities, highly desirable for their own beauties or as a backdrop for parks (Figure 1).[10] For Uvedale Price, trees were essential for the picturesque-improved landscape. Rising 'boldly into the air', in beauty they 'not only far excel everything of inanimate nature', but are 'complete and perfect' in themselves. Trees offered 'infinite variety' in their 'forms, tints … light and shade', and the 'quality of intricacy', composed of 'millions of boughs, sprays and leaves, intermixed … and crossing each other' in multiple directions. Through their many openings, the eye discovered 'new and infinite

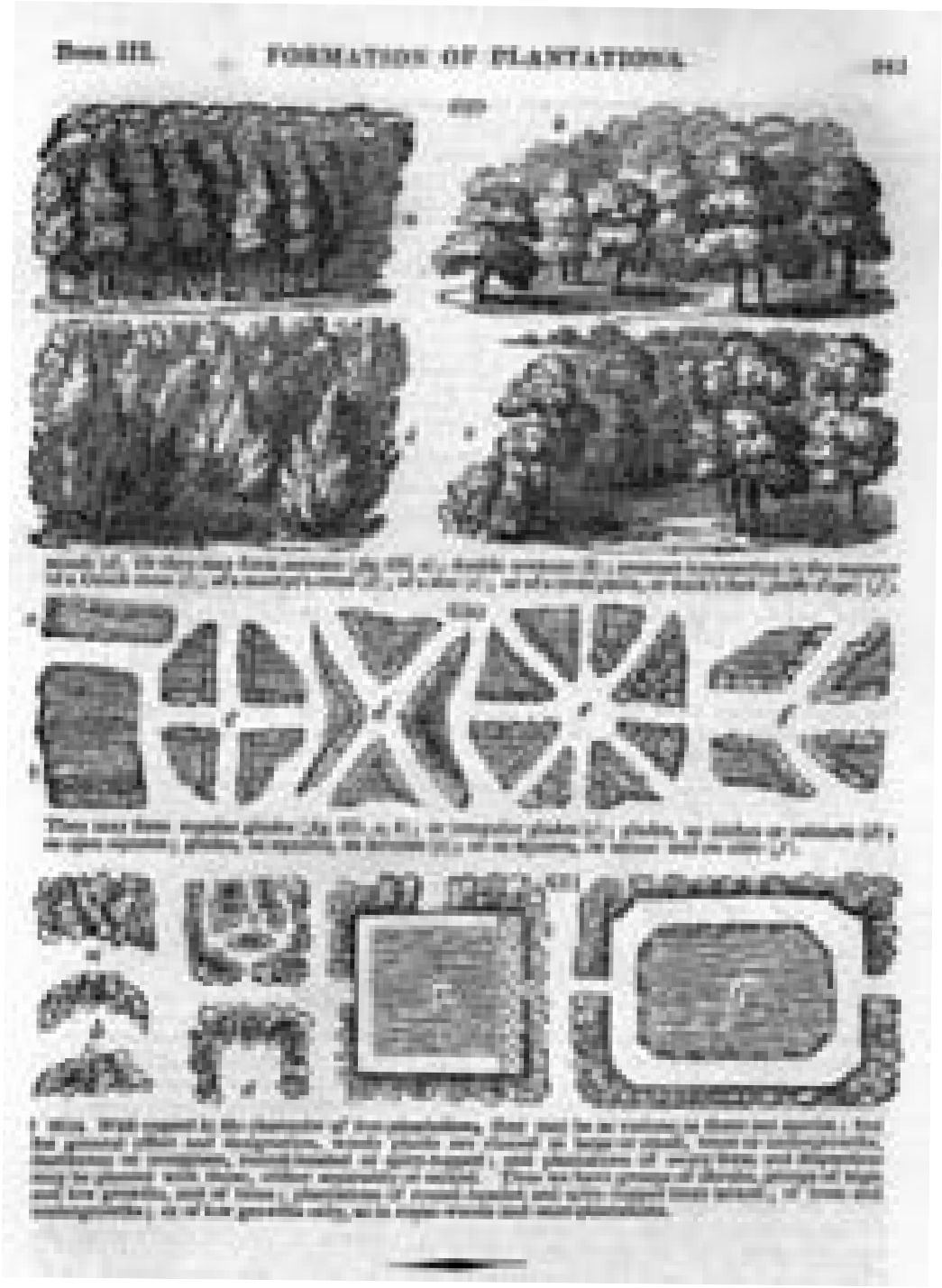

Figure 1. Instructions for the formation of plantations from John Claudius Loudon, *Encyclopaedia of Gardening* (London, 1830), p. 943

combinations', yet this 'labyrinth of intricacy' was no 'unpleasant confusion', but a 'grand whole … of innumerable minute and distinct parts'.[11]

THE GLOBAL ARBORETUM

Developments in science, technology, and their application to arboriculture such as studies of plant circulation and photosynthesis, soil chemistry and geology, iron and glass houses, the Wardian case, and tree transplanting using the railways, promoted and publicized in the burgeoning garden press, made it quicker and easier to accumulate exotic specimens.[12] Facilitated by Loudon's publications, the idea of arboretum was adopted beyond Britain, especially in Europe, the USA and the British Empire. In France, aristocrats and botanists such as Henri-Louis Duhamel du Monceau (1700–82) and Pierre Philipe Andre de Vilmorin (1776–1862) accumulated large collections and performed arboricultural experiments.[13] The Segrez Arboretum near Paris was developed by the botanist and horticulturist Pierre Alphonse Martin Lavallée (1836–84) on the park of the Château Segrez in Saint-Sulpice-de-Favières, which he purchased in 1856. Lavallée, who served as President of the Societé Nationale d'Horticulture de France, tried to assemble all the indigenous and exotic trees and shrubs then available from British, French, German and American sources that would grow in the French climate. He published a catalogue of the 4267 species and varieties in the arboretum which was visited by European and American botanists including Asa Gray, Philip Franz von Sibold and Sargent.[14]

The introduction of British picturesque gardening ideas and practices into Germany and related influx of global specimens helped to encourage attention to more varied planting and arboretum provision. In contrast with France, this was encouraged by close contacts between royalty and aristocracy, notably the marriages of Queen Victoria to Prince Albert and, later, their daughter Victoria, the Princess Royal, to Prince Frederick William of Prussia. Imperial rivalry with the British and French also provided important motivation from the 1870s and the exploration and acquisition of German colonies, particularly in Africa, became an important source for new specimens, an opportunity for botanical experimentation and exploitation. German landscape gardeners such as Emil Sello (1816–91) and Hermann Walter (1837–98) crossed the Channel to observe British gardening practices. Walter, for example, was employed by the British royal family between 1856 and 1861, whilst Sello observed British gardens in 1840 and 1865–66, meeting John Lindley and Loudon and serving as a judge at the Royal Horticultural Exhibition in 1866.

The Späth Arboretum at Baumschulenweg near Berlin was developed in 1879 by Franz Ludwig Späth (1839–1913), partly as a pleasure ground around a newly acquired mansion, and partly for the family nursery business, in existence since 1720 (Plate II). The plan was by Johann Gustav Meyer (1816–77), Director of the Berlin City gardens and a former pupil of Peter Josef Lenné (1789–1866) at the Potsdam garden school. Although Lenné did not fully adopt Loudon's picturesque style, he encouraged the use of new varieties in German gardens and, in commissions such as the design for the remodelled Tiergarten in Berlin, he has been credited with introducing a more British style. This is reflected in Meyer's picturesque plans for various parks around Berlin and the Späth arboretum, which included a lake and accommodated some four thousand exotic and hardy German species and varieties for commerce, botany and pleasure.[15]

New specialized forms of arboretum were developed for other climates, such as tropical palmetums. Specimens, tree-transplanting techniques and apparatus were exported between the countries of the British Empire. Arboretums were developed, for instance, at the Calcutta Botanical Gardens during the 1860s, the Castleton Botanical Gardens in Jamaica during the 1870s, the Dominion Arboretum and Botanical Gardens, Ottawa, Canada, during the 1880s, and the Zomba Botanical Gardens in British Central Africa during the 1890s. These tried to incorporate both ornamental and potentially

economically useful specimens from Britain and around the Empire, such as the Indian fig and teak trees planted in the Castleton gardens. The 26-hectare Dominion Arboretum, for example, effectively a national institution, was established on an experimental farm in 1887 and served as the most northerly of North American arboretums, providing an opportunity for experimenting with varieties in cold climate conditions.[16] Finally, in the USA, gardeners and horticulturists looked to British arboretums as a model. In 1868 the Philadelphian nurseryman Josiah Hoopes noted that, despite the many large British pinetums and some of his 'energetic' compatriots devoting 'much time' to creating 'quite creditable collections', many Americans remained still 'almost entirely ignorant of their existence'. The impact of British arboretums in the USA is evident in the work of Andrew Jackson Downing and Frederic Olmsted, and in many nineteenth-century private and public parks and gardens during the second half of the nineteenth century, particularly, of course, the establishment of Arnold Arboretum. There are now an estimated eight hundred botanical gardens and arboreta in the USA (Figure 2).[17]

APPROACHES TO THE ARBORETUM

Recent work in landscape history, cultural and historical geography, and the history of science has developed new approaches and emphases in studies of tree collections and arboretums. Traditional institutional and garden history approaches have tended to focus upon designers, owners and promoters (frequently from the elite, aristocracy or government). Whilst this remains, of course, important, many individuals and agencies were usually involved in the promotion, design, usage, and consumption of arboretums and, like urban parks, they cannot simply be regarded as outcomes of the will of landscape gardeners or promoters. The frequently contested nature of arboretum designs,

Figure 2. View across the Arnold Arboretum towards Boston centre from Peter's Hill

management and usage has tended to be obscured, just as controversies associated with many early Victorian parks were effaced by subsequent public pronouncements which presented them as the natural and inevitable outcomes of rational recreational, sanitary and leisure needs and civic communal will. Prosopographical approaches akin to those utilized in studies of scientific communities during the 1970s and 1980s help to illustrate the diversity of individuals and agencies associated with arboretums where subscription lists, visitor records or other such data survive, demonstrating, for example, differences in gender, and religious and political characteristics.

Arboretums were likened to 'living museums' and, particularly those with systematic labelled displays, numbered plans and guides, served, with botanical gardens, as important inspirations for Victorian museums, which also tried to assert their rational objective status through architecture, modes of classification, labelling and display. As laboratories, places for the production of scientific knowledge, arboretums are amenable to the kind of approaches favoured in the sociology of scientific knowledge and history of science. In growing specimens from around the globe, arboretums sometimes aimed to replicate in microcosm the originating sites. Trees and shrubs within the arboretum were usually clearly labelled and demarcated from those outside, to prevent identity confusion and reduce interbreeding, whilst specimens were usually placed apart from each other or separated by spaces or boundaries. Arboretums also tended to have their own kinds of characteristic spaces and might be divided by taxonomy, climate, zone or geography. In addition, like institutional laboratories, their nineteenth-century development was associated with particular tools, practices, supply and support networks, and trained staff such as arboriculturists and gardeners.[18]

Whilst such features represent a kind of idealized, objectivized collection akin to printed arboretums in arboricultural treatises, like laboratories, the reality varied considerably according to different socio-cultures. Unlike laboratories, museums or glass house collections, arboretums were obviously situated outside and were therefore vulnerable to climatic and seasonal conditions and, in the context of rapidly industrializing Victorian society, the grime of air pollution. Even within the relatively small confines of the British Isles, geological, climatic, meteorological and other factors militated against the establishment of systematic, representative collections in all areas. Palmetums, for instance, were usually confined to the warmer climates of the Channel Islands, the west and south-west coasts, and the south of England. George Nicholson, Curator of the Royal Botanic Gardens at Kew, during the 1880s produced a guide to the different kinds of trees and shrubs that could be planted in various conditions including chalky, clay, sandy and peaty soils, marshy and boggy conditions, and waterside. Across the vast expanses of the USA and Canada the variations were even more marked. Sargent divided the North American continent from Arctic periphery to Mexican border into nine fundamentally different 'tree regions' defined according to the 'prevailing character of aborescent vegetation' (Plate IV). Tree collections in urban areas presented their own special problems and in his selection of trees and shrubs that could be 'best calculated to withstand the smoke and chemical impurities of atmosphere' within manufacturing towns, Nicholson tried to distinguish between those best adapted to withstand the industrial conditions of northern, midland and southern towns.[19]

Likewise, systems of labelling, classification and positioning tried to present an ordered image of external nature but masked considerable taxonomic disagreements that were particularly acute when placing novel specimens or closely related varieties (Plate III). Faced with the task of producing a comprehensive arboricultural treatise on hardy British trees and shrubs, Bean noted the 'enormous number of new species' that had

become available for cultivation since Loudon's day through the activities of collectors, such as William Lobb (1809–64) in Chile and California, and Robert Fortune (1812–80) in Japan and China. Chinese varieties proved particularly challenging given that many remained unclassified or unnamed, whilst the designation of 'hardy' was difficult to apply as it depended upon gardening taste, economic value and experience. Systems of nomenclature provided no necessarily fixed framework either. In Bean's view, the tendency within botany had gone from reducing the number of genera and species in mid-century, which had been 'carried too far', towards the revival of older generic names. However, by the early 1900s, particularly in Europe and the USA, attempts to subdivide species, genera and natural orders had become so prevalent that Bean feared it would 'involve such confusion and readjustment of nomenclature as to render its acceptance by cultivators' in Britain highly unlikely.[20] Just as the international political scene was deteriorating with the jarring of empires, so the arboricultural world seemed to be fragmenting nationally. This favoured the production of systematic arboricultural treatises and prestigious national arboretums for botanical experimentation and classification, which could then be utilized as authorities for national botanical publications.

The many post-Linnaean international disagreements that occurred in the nineteenth century and the difficulties faced by the promoters of systematically planted arboretums are evident with respect to *Coniferae*. During the 1820s, Louis Claude Richard arranged the order into three tribes of *Taxineae*, *Cupressineae* and *Abietineae*, which was basically followed by Loudon and other botanists, although changes were made by some such as Heinrich Friedrich Link's separation of *Picea* (spruce) and *Abies* (silver firs) as distinct genera from *Pinus*. Loudon also adopted the suggestion of John Lindley that the order of *Taxaceae* be divided from *Coniferae*, but this was not generally adopted. Subsequently, Stephen Endlicher in Vienna defined *Cupressineae*, *Abietineae*, *Podocarpeae* and *Taxineae* as natural orders subdivided into tribes, which was generally accepted by Continental botanists. However, in 1881, George Bentham tried to simplify the systematic arrangement of *Coniferae* into six tribes, with various adjustments at the level of genera, whilst August Wilhelm Eichler in Berlin arranged the genera into two primary divisions of *Pinoideae* and *Taxoideae*, including conifers proper in the former and *Taxads* (the genus of yew) in the latter. In 1892, the Royal Horticultural Society tried to stabilize and standardize these international movements by holding a 'Conifer conference' at Chiswick, Middlesex, which it was claimed brought together 'the most remarkable collection of specimens cut from Taxaceous and Coniferous trees and shrubs ever assembled' and resulted in the publication of a special volume of papers. The resulting systematic revision of the order was undertaken by Maxwell Masters and published by the Linnean Society, but, almost immediately, practical textbooks such as Veitch's *Manual of Coniferae* (London, 1900) adopted 'deviations' from this.[21]

Disagreements concerning nomenclature were particularly evident where names celebrated political figures, nations, or empires which were not universally popular, and there were 'numerous and perplexing' differences between 'European and American authorities' concerning the names of *Coniferae*. Taking the example of *Sequoia* again, the application by John Lindley in Britain of *Wellingtonia* and Albert Kellogg in California of *Washingtonia* to the *Sequoia sempervirens* on the basis that a Californian tree should not bear the name of a British soldier, caused international botanical controversy and resulted in the widespread use of *Sequoia Wellingtonia* and lengthy lists of names in books and labels as a compromise.[22]

Wrenched from original climatic and geological contexts, trees and shrubs may grow, of course, in very different ways from those originally observed *in situ*, thriving

in unexpected ways, or succumbing to unanticipated diseases or predators. In this respect, studies of nineteenth-century arboretums and arboriculture provide some support for the emphasis in Actor Network Theory upon material goods, objects and the multiple agencies of living entities exemplified in Latour's studies of laboratories and scientific institutions. Perceiving arboretums as living museums or tree laboratories can downplay the implications of the 'living' part, and the results of floral, fauna and human interaction, particularly apparent in 'declining' arboretums, where resources were reduced. However, the 'situatedness' of trees and the importance of non-human agencies in nineteenth-century arboriculture should not be exaggerated. Arboretums remained predominantly highly controlled and managed places, partly reflecting the knowledge and experience of centuries of horticultural experience, whilst, as the industrial scale of Victorian and Edwardian tree transplanting reveals, tree places could be a highly mobile phenomenon.[23]

CRITICISMS OF ARBORETUMS

The provision of arboretums and other botanically inspired collections was not, however, universally welcomed, and there remained a vein of criticism towards them throughout the nineteenth century. Uvedale Price warned against those who thought that they could achieve variety by exhibiting 'in one body all the hard names of the Linnaean System'. This would be 'in a botanical light … extremely curious and entertaining', yet such a 'collection of hardy exotics' was 'part of the improver's pallet', not a picture. Such displays resulted in 'a sameness of a different kind, but not less truly a sameness than would arise from their being no diversity at all'.[24] Although Paxton made his name partly through the planting of celebrated arboretums and pinetums at Chatsworth, Derbyshire, he thought systematic collections inappropriate in most contexts which commanded no other attractions to delight the eye, such as views of distant country or streams.[25] One response to criticisms of botanical collections was to devise others that placed greater emphasis upon formal features and claimed to marry taxonomy with aesthetics; another was to reject formal representation completely. In 1812 Loudon published a design for a spiral botanical garden 'arranged so as to combine elegance and picturesque effect with botanical order and accuracy' that was later, like his design for iron-framed curvilinear glazing, adopted by the Loddiges nursery company in Hackney, east of London (Figure 3). The garden was 'intended to comprise a complete collection of the vegetables growing in this country' and was arranged according to the Linnean system with the twenty-four orders planted in picturesque groups surrounding a central hothouse to house the exotics.[26]

Various other forms of plan were suggested to overcome the difficulties of combining taxonomies with aesthetics including those founded, like some ancient and medieval gardens, upon zonal or geographical representation. John Spencer's pinetum at Bowood, Wiltshire, grouped specimens according to country of origin, and Charles Smith produced a remarkable design for a star-shaped arboretum based upon the display of families.[27] The use of terms such as 'arboretum' and 'pinetum' for small plantations or collections also attracted criticism for pomposity. However, the most fundamental criticisms levelled against systematic arboretums stemmed from growing hostility towards the introduction of alien exotic species, which botanical collections, of course, helped to encourage. Leading the charge after 1870 was William Robinson, for whom 'native' trees held a special place in the wild garden. Robinson complained that 'the passion for the exotic is so universal' that many of the finest native varieties were never planted, whilst money was 'thrown away like chaff for worthless exotic trees like the Wellingtonia, on which

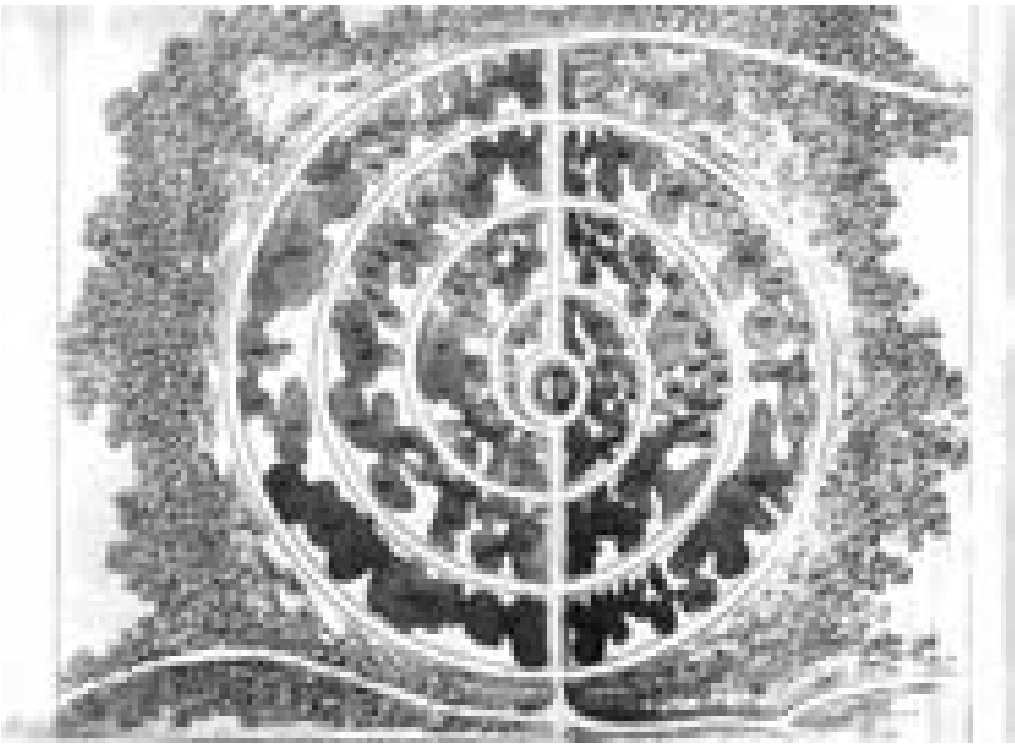

Figure 3. Design for a spiral botanical garden; from John Claudius Loudon, *Hints on the Formation of Gardens and Pleasure Grounds* (London, 1812), pl. XVII

tree alone fortunes have been wasted'. The costly 'regulation pinetum' prevalent on many estates, was 'not by any means the best way' of growing trees and the isolation and 'dotting about of specimens' was 'very far from artistic'.[28]

Nineteenth-century arboretums flourished in five broad contexts, and how each encouraged differences in planting, design, management and consumption is now examined. They were usually associated with the parks of landed estates, commercial nurseries, scientific and botanical societies, and cemeteries. These forms were, of course, not necessarily discrete and there was considerable interaction and emulation between different versions.

INSTITUTIONAL ARBORETUMS

Botanical society gardens provided an influential model for nineteenth-century arboretums, having been developed in Europe from the physic garden, and by the early nineteenth century many contained specially designated areas set aside for tree and shrub collections. The earliest British examples at Oxford, Cambridge, Glasgow and Edinburgh were associated with universities, whilst other botanical gardens such as Glasnevin, Dublin, were partly motivated by nationalism. The growth of botanical societies during the eighteenth century led to the need to raise incomes to support gardens and scientific educational ventures, such as the provision of lectures; and matters of governance were influenced by individuals. Whilst it had the common hierarchy of aristocratic patrons, the Horticultural Society of London, for instance, brought together gardeners, landowners, nurserymen, landscape gardeners, medical men, and others with amateur and professional interests in the collections. Similarly, gardens of the Royal Botanical Institution of Glasgow were the joint property of the university and a group of subscribers, including local

nurserymen, who devised the plan of the garden. The institutional model of the Liverpool Botanical Garden, founded primarily by the manufacturer and historian William Roscoe, was much copied in British provincial towns such as Sheffield, Manchester, Hull and Birmingham.[29]

The ready transportation, sale and consumption of novel tree and shrub specimens from across the globe by botanists, collectors and landscape gardeners, and the need to identify and catalogue these, facilitated the development of taxonomies from the late seventeenth century. The Linnaean system helped collectors to identify specimens, or at least, be sure of their novelty even in the furthest reaches of American forests, by emphasizing differences between reproductive organs using archetypal specimens, which became much prized for learned and amateur collectors alike.[30] The system, therefore, provided a form of virtual club and system of regulation and adjudication that novice botanists were compelled to learn to gain entry to the scholarly community, which could be facilitated through advocacy from powerful individuals and institutions, such as Sir Joseph Banks, the Royal Society or the Linnean Society. This helps to explain why the natural system, often presented as a rival, especially in Britain, which emphasized 'natural' characteristics rather than a quite rigid choice of artificial qualities, took decades to become established. Although a recent analysis has emphasized the role of botanical textbooks in the acceptance of the Jussiaeuian system, especially those by James E. Smith, the fact that by the 1790s various botanical society gardens and arboretums included Linnean and natural arrangements beside each other cannot be ignored.[31]

Changing arrangements of botanical society collections were stimulated by the demands of botany and scientific education and the need to present Enlightenment taxonomies. However, the breadth of professional and amateur interests, apparent in both London and provincial botanical societies, and the need to attract subscribers and paying visitors meant that there was pressure to apply the principles and practices of landscape gardening to create visually interesting and attractive places. This is apparent in the design of three national botanical society arboretums: the gardens of the Botanical Society at Glasnevin, Dublin, established in 1798, the gardens of the Horticultural Society at Turnham Green and the arboretum at Kew after 1850. Largely designed by the physician and Professor of Botany, Walter Wade, the Glasnevin gardens included a 'Hortus Linnaeensis', a 'Hortus Jussieuensis' comprising all the orders of hardy specimens in Britain and 'Hortus Hibernicus' of native Irish plants.[32] Indeed, this may be the first use of the term 'arboretum' to designate a specific place where trees are grown rather than being a retrospective application. The arboretum took the form of a linear strip along the south-west side of the gardens, of a similar width to – and adjoining – the 'plantation skreen'; within this border the arboretum was intermixed with a fruticetum and took up much of the south-western half of the garden.[33] The Glasgow Botanical Gardens also combined aesthetic, scientific, commercial and medicinal concerns and incorporated various different collections surrounded by a plantation belt including a section for medical plants for sale and specimens planted according to the Linnaean and Jussieuian systems, although this was not called an arboretum.[34]

Although planting made some attempt to follow genus, the arboretum laid out during the mid-1820s at Turnham Green for the Horticultural Society by William Atkinson consisted of clumps of ornamental and fruit trees, plants, turf and a sinuous canal (Figure 4). This provided picturesque views from the Society's buildings and was criticized by Loudon as being inappropriate for a scientific society.[35] The competing needs to attract visitors with colourful and enticing vistas, yet satisfy the botanical community by providing the pre-eminent national tree collection, are evident in the arboretum laid

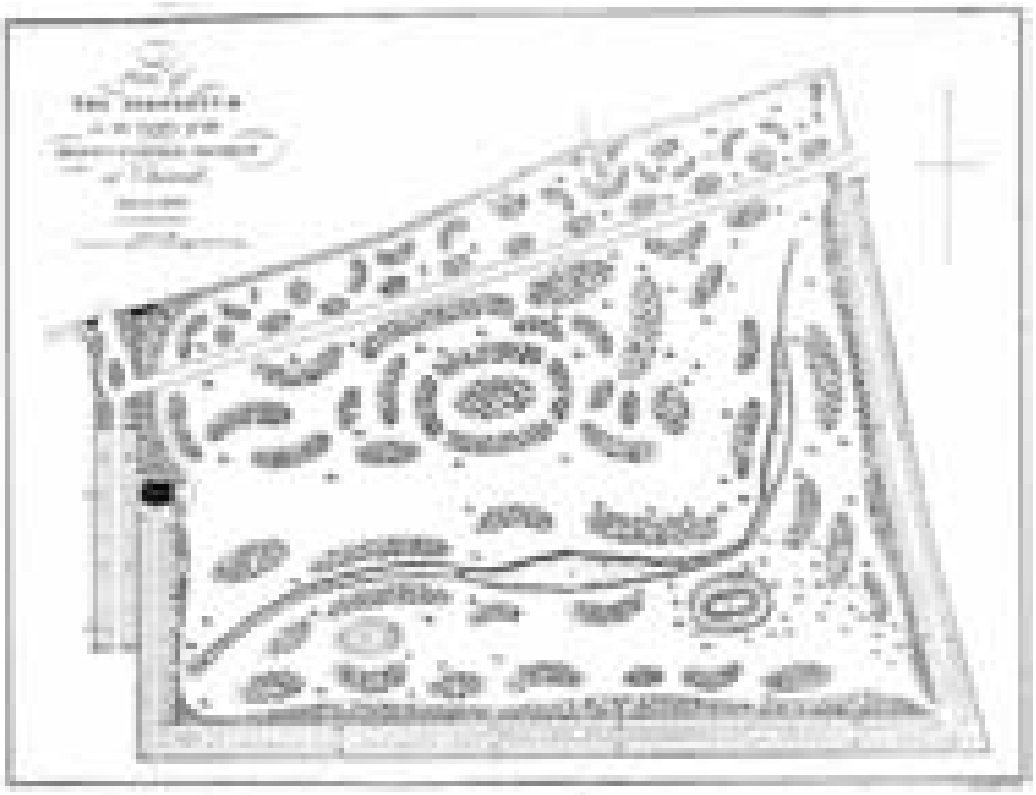

Figure 4. '*Plan of The arboretum in the Garden of the Horticultural Society at Chiswick, March, 1826*'; from *Report of the Garden Committee* (London: William Nicol, 1826)

out at Kew by William Nesfield and William Hooker during the 1840s and 1850s, which replaced a much smaller, overcrowded Georgian plantation.[36] Although Hooker indicated that taxonomy was paramount, as an artist Nesfield aimed to create a harmonious arboretum that balanced taxonomy with aesthetics (Figure 5). Varieties were carefully arranged in picturesque clumps to form views with attention to changing shapes, sizes and colours, whilst formal Italianate walks towards Decimus Burton's new palm house were provided.[37]

NURSERY COLLECTIONS

The numerous British commercial nurseries and international botanical networks that they utilized provided the most important source of trees for the new arboretums. Many nurserymen had worked and been trained on aristocratic estates and therefore knew the demand from landowners, gardeners and casual buyers very well; they advertised widely through their own catalogues and the burgeoning gardening press. After Joachim Conrad Loddiges came over from Germany in the eighteenth century, for example, his family company prospered and secured a position as, probably, the leading British nursery company by the early nineteenth century. Printing successive catalogues in German, Latin and English, the firm prospered, supplying private and institutional collectors, including Kew, whilst individual members of the family, such as George Loddiges, became important botanists and scientific activists.[38] Similarly, the Veitch family expanded their nursery businesses at Exeter, Chelsea, and other sites by astute plant breeding and promotion and sending plant hunters around the globe to hunt for exotics in order to exploit the

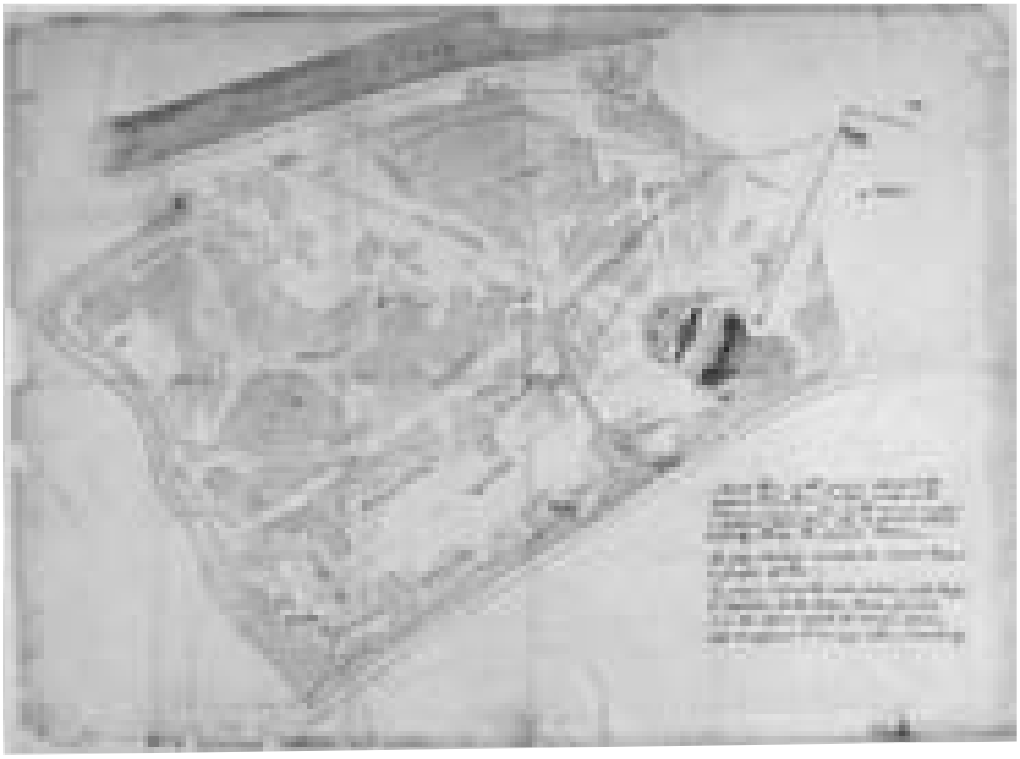

Figure 5. William Nesfield's plan for the arboretum at Kew, 1845.
Courtesy: Royal Botanic Gardens, Kew

expanding market for Victorian urban and suburban gardens stimulated by Loudon, Shirley Hibberd and others. They became one of the largest nurseries in Europe by the mid-nineteenth century, underlying their arboricultural expertise by publishing successive editions of their *Manual of Coniferae*.[39]

The need to maintain sufficient income was, of course, the primary determining factor in the design, management and usage of commercial nursery collections. Nurserymen had to sustain the market through expansion and securing novel specimens or growing striking and interesting hybrids that could be marketed successfully for Victorian gardens, parks and estates, which helps to explain the proliferation of varieties that so exasperated later arboriculturists such as Bean. These factors helped to determine the layout of the Loddiges nursery garden at Hackney from *c.*1820 with its range of glass houses and spiral walks reminiscent of Loudon's aforementioned design for a spiral botanical garden published in 1812 (Figure 6). Like Repton's garden at Ashridge Park, the Hackney arboretum adjoined a separate American garden but, in this case, it occupied the spaces between the four outer concentric paths of a broadly triangular area, the shape being determined by the plot of land available. The American garden in the central section had a path that wound around until it reached a central place, whilst a straight path, also reminiscent of Loudon's design, cut across both the arboretum and American garden to facilitate easy access. Named display specimens grown to their full size were arranged alphabetically, standing in front of rows of seedlings and cuttings for purchase, it being claimed that the nursery had all specimens that could be grown in the British climate.[40] The Lawson Company of Edinburgh and London was, of course, famous for its varieties of Lawson cypress (*Cupressus lawsoniana*). Other nurseries promoted different special trees by seeking and publicizing awards such as Anthony Waterer's 'beautiful bright green'

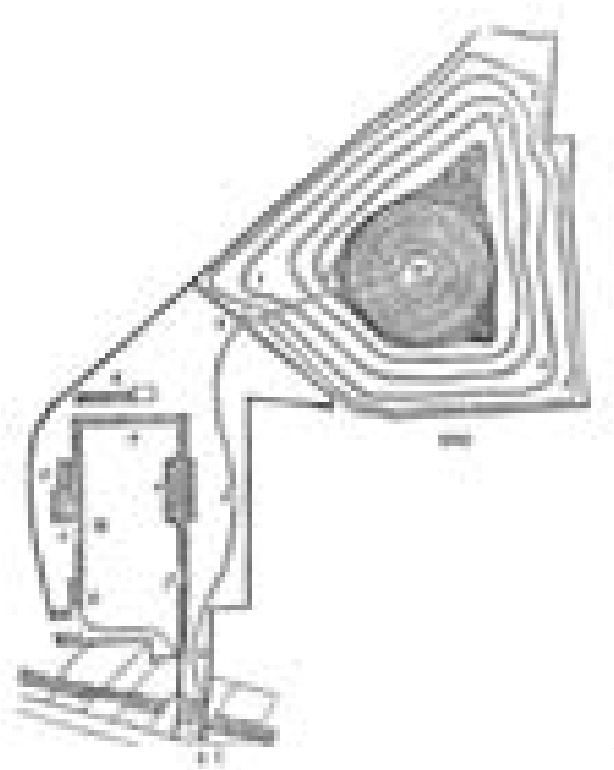

Figure 6. Plan of Loddiges gardens; from John Claudius Loudon, *Encyclopaedia of Gardening* (London, 1830)

erect version of the cypress (*Cupressus lawsoniana erecta viridis*), claimed to be 'the finest hardy evergreen in existence', or Maurice Young's multi-award-winning Golden Chinese Juniper.[41] Commercial demands were paramount, but nursery collections, nevertheless, provided a crucial resource for the development of arboretums through supplying specimens, training staff, providing design models and publishing reference works. Loudon, for instance, learnt much from Loddiges nursery, with individual specimens and the unusual spiral design providing much material for the *Arboretum et Fruticetum Britannicum*, and specimens and inspiration for Loudon's commissions such as the Derby Arboretum.[42]

ESTATE ARBORETUMS

The economic, botanical and scientific significance of trees in British society, underscored by the prizes for planting awarded by the Society of Arts, encouraged major landowners to undertake large-scale planting between 1750 and 1850. Special kinds of tree collections or plantations, described as arboretums in the nineteenth century, were nurtured on many estates, usually associated with landscape gardens or their boundaries, although some estate arboretums came to occupy large areas. Until the period of agricultural decline from the end of the century and, especially, the commercial decline of estates in the 1920s and 1930s, manpower requirements necessitated systems for training many workers in agriculture, forestry, horticulture and arboriculture. Estates provided the resources to create extensive arboretums, sometimes at the instigation of landscape gardeners and managers and, on other occasions, through the impulse of aristocratic owners, who regarded arboretums as important fashionable creations. Encouraged by aristocratic patrons, nineteenth-century landscape gardeners such as Paxton and Barron were able to

create major arboretums and pinetums that provided influential models for all other kinds of arboretums and training grounds for many gardeners, arboriculturists and foresters. The public remained excluded from many, such as Elvaston during its first couple of decades and Westonbirt. However, some estate arboretums, such as Whiteknights near Reading, which became a kind of urban park, and Paxton's at Chatsworth, provided popular destinations for arranged trips and, therefore, a source of inspiration for much smaller parks and private suburban gardens. Just as the model of the British landscape park provided a source of emulation for American gentry, so the arboretum form spread to the United States, especially the estates of New England, Virginia and eastern landowners whose contact with Britain remained particularly strong. Henry Winthrop Sargent, for instance, Andrew Jackson Downing's friend and executor, developed a celebrated pinetum at Wodenethe by the Hudson after a European trip. Similarly, Horatio Hollis Hunnewell included another informally arranged pinetum inspired by Elvaston at his estate near Boston from *c.*1860.[43]

Different motivations for the creation of estate arboretums are evident in their design and management over the course of the century, particularly the potentially conflicting requirements of forestry, botany, rural sports, landscape gardening, private pleasure and public amusement. In the plantations of Whiteknights, for example, picturesque display and effect dominated. Paxton's pinetum and arboretums at Chatsworth were arranged botanically along curving paths, with views from the slopes behind the Duke of Devonshire's neo-classical house providing most of the picturesque beauty. Some two hundred species were arranged across 40 acres, according to Loudon's *Hortus Britannicus*, in seventy-five groups on both sides of an ascending walk, and the scientific name, country and year of origin, height in native country, English name and date of planting of each specimen were painted upon oak tallies. At Biddulph Grange, Bicton and Westonbirt, in contrast, whilst considerable attention was given to botany, arrangements

Figure 7. '*The Auraucaria Avenue at Bicton*'; from Veitch, *Manual of Coniferae* (London, 1900)

were primarily determined by picturesque effect (Figure 7 and Plate V). Carriage rides and viewing bays were incorporated around the arboretum at the latter, providing avenues so that individual specimens and groups could be enjoyed by members of the Holford family from horse or carriage (Figure 8).[44] At Eastnor, where William Coleman worked for Earl Somers, there was a carriage ride 3 miles long from the lodge at British Camp to the Castle 'flanked by evergreen as well as deciduous trees and shrubs', including yews, the wild service tree, Arbutus and many varieties of *Crataegus*.[45]

PUBLIC ARBORETUMS

Another form that appeared in Victorian Britain was the public urban arboretum, promoted, like urban parks generally, as a rational recreational institution and as a response to industrialization, poverty and urban squalor that would help to gentrify areas, as the attendant middle-class villas frequently constructed around them underscored.[46] Public arboretums were advocated by landscape gardeners, especially Loudon, as alternatives to exclusive aristocratic gardens, although as we have seen, other park promoters, such as Paxton, argued that public arboretums were not usually suitable as public parks.[47] The most celebrated example of a public arboretum was designed by Loudon at Derby for the

Figure 8. '*Group of Cupressinae at Westonbirt, Gloucestershire*.'; from Veitch, *Manual of Coniferae* (London, 1900)

wealthy industrialist Joseph Strutt, who employed his share of the considerable wealth from the family's textile manufactories to donate a public park to the town. Although the site was fairly small at just 13 acres, following Strutt's instructions, Loudon tried to form the most comprehensive public arboretum possible, a physical realization of his mammoth textual creation with over one thousand species of trees and shrubs planted amongst curved, circuitous walks interspersed with snaking mounds designed to create an illusion of space. Using a published guide to identify each specimen, visitors could walk amongst the labelled trees and shrubs arranged according to the natural system and labelled on brick tallies with botanical name, common name, place of origin, height in native habitat, and the date of introduction into Britain. With gratuitous entry on two days, the Derby Arboretum did encourage the working class botanizing, evident, as Loudon remarked, amongst many tradesmen, operatives and their families. However, like museums and botanical gardens, in remaining primarily a subscription-based institution and promoting an image of rational, objective science and appropriate reflective and respectful conduct and behaviour, Derby and other public arboretums helped to differentiate and shape Victorian middle-class identity.[48]

As one of the few major practical realisations of Loudon's landscape gardening philosophy and concept of the public park, the Derby Arboretum exerted an important influence, encouraging the development of other public arboretums but, more so, with the new parks at Manchester, Birkenhead and other northern towns, it served as a pre-eminent model of an urban public park. Public arboretums were formed in a number of other towns including Nottingham (1852), Ipswich (1853), Walsall (1873), Lincoln (1872) and Worcester (1859), but these were all, to a large degree, urban public parks that provided special attention to tree planting (Figure 9).[49] The Nottingham Arboretum, designed by Samuel Curtis on a hilly site as part of a massive scheme of urban enclosure and town planning reminiscent of Birkenhead, followed the Derby example most closely, but, as at Derby, access became an important political issue. Until the 1850s the legal

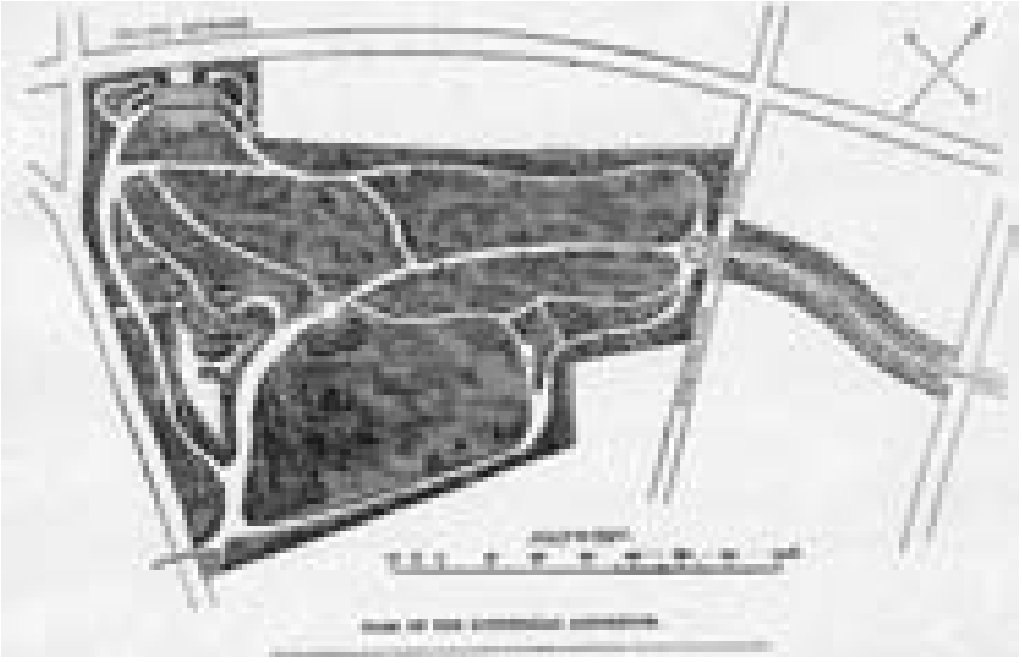

Figure 9. '*Plan of the Nottingham Arboretum*'; from *Illustrated London News* (15 May 1852)

status of urban parks as municipal institutions remained doubtful and charges were levied at both Derby and Nottingham on specific days. Festivals and other events organized by governing committees proved tremendously successful regional events that attracted crowds from across the Midlands, but public arboretums and parks came to rely on such events for funding when revenue from local taxation remained unavailable. After the first few decades public arboretum collections tended to suffer in the face of demand for urban park facilities, such as sports and recreation, and it proved too expensive to maintain the ambitious botanical collections originally established.[50] Organic and always changing, they were more vulnerable than museums to economic fluctuations, air pollution, staff depletion, changes in taste and leisure, and national crises, such as wars, when objects in the latter could be placed in storage. With their often grand and centrally located buildings, frequent association with libraries and diverse dead and inorganic collections, which could be rearranged to suit current political, scientific or aesthetic concerns, museums were more emphatically civic institutions and survived more successfully.

The campaign to transform the Royal Victoria Park in Bath into an arboretum during the 1850s reveals the allure that public arboretums had, some of the difficulties engendered by their creation, and the complexity of the relationship between paper arboretums and their realization on the ground. The most prominent supporter of the venture was the registrar and surgeon Frederick Hanham, who compiled a catalogue of trees and shrubs in the park. Hanham's work was, however, much more than a catalogue, but a manifesto for public arboretums as rational recreational institutions and a 'measure of his hearty wish to co-operate' in forming an arboretum, to increase the 'value and attractions of the park', by 'combining science with recreation and pleasure'.[51] A public arboretum, which was one of those institutions now 'becoming so numerous and fashionable', would help to preserve rare and valuable trees, stimulating interest by adding science to picturesque beauty, leading to admiration of the works of God and 'an exalted life of nature', whilst facilitating 'mental training', youthful observation and discrimination.[52] He emphasized that the Derby Arboretum was 'visited annually by a large number of persons, strangers to Derby, on account of, and solely for' its 'correct and scientific … collection of trees and shrubs'. There was no reason why, in 'scientific and practical terms', just as the Derby Park provided an authoritative northern collection, so Bath Park could 'in addition to being a place for recreation and pleasure', become a similar regional collection of living specimens for 'reference'. In the face of the shortening season and the 'serious diminution' of annual subscriptions, an arboretum with special emphasis upon evergreens would enhance Bath's position as desirable winter resort and promenade as evidenced by the 'vigour and health and longer season of trees and shrubs in the vicinity'. The 'mild, sheltered and temperate' climate, which he claimed was evidenced by his experience as registrar and medical officer, would attract new visitors and residents.[53]

Hanham went to great lengths to devise a 'correct and scientific nomenclature' for the plants with labels and a catalogue, although the information concerning the description and location of specimens was highly subjective and localized. The maple-leaf plane, for instance, was described as being situated on the upper lawn and between the obelisk and pond. The book also included details of specimens that he considered necessary for the committee to purchase in the future.[54] Tellingly, Hanham looked to the Derby Arboretum and 'the celebrated and extensive pinetum' at Elvaston Castle as collections of authority for comparison before Kew, Chiswick, Regent's Park and other national collections. However, he encountered many problems and the process of comparing took some years, particularly concerning the *Ulmus*, *Crataegus* and some of the *Coniferae*, which he consoled himself were 'generally considered difficult by botanists' to identify

because of their 'protean character'. The disappearance and introduction of new trees and shrubs provided further problems. Although the committee tried to implement his plan by buying new specimens that were 'wanting to complete certain classes', including the auctioned contents of a local nursery, he emphasized that these were included as 'desiderata to be restored or otherwise, an undertaking of this kind, it must be obvious, at the period of its publication, would always be incorrect' and the 'great deal of time and labour expended in vain'.[55] The apparent botanical comprehensiveness and objectivity of Hanham's arboretum was thus achieved by incorporating various walks and commons never originally included within the park boundary, including trees and shrubs that had disappeared and others that might never appear. His work concerned an arboretum that only already partially existed, supplemented by an integrated 'virtual' idealized arboretum of specimens that might never be replaced and others that probably never came to be planted.

GARDEN AND ARBORETUM CEMETERIES

The final example of nineteenth-century arboretums are garden and arboretum cemeteries. Burial grounds had, of course, often been used as public walks in Georgian towns; it was, therefore, not surprising that, given this cultural significance, they should also have been promoted as public gardens and, from the 1830s, as arboretums by Loudon and other landscape gardeners and social reformers. Immediate inspiration came from Père-Lachaise cemetery in Paris and Mount Auburn near Boston, which received many British visitors (Plate VI). However, it was only when new cemeteries came to be promoted as a response to nonconformist exclusion, poor sanitation, urban squalor and the overcrowded traditional churchyards that the garden cemeteries were created. Some promoters of new urban cemeteries contended that they could provide opportunities for rational recreation as well as pious memorializing and contemplation, through the provision of specimens to provide botanical education. Abney Park Cemetery, Stoke Newington, for instance, opened in 1840 by a limited company, included an arboretum planted around the perimeter with two thousand labelled tree and shrub species, mostly supplied by the nearby Loddiges firm, and a catalogue distributed with a guide and history (Plate VII). Although intended to be non-denominational, Abney capitalized upon its nonconformist associations to become a particular favourite for Congregationalists, who were guided upon tours of the graves of community worthies by successive editions of guidebooks purchased at the entrance. The major problem with this model was, however, that space for interments ran out, despite a regimented grid plan system in which usage was maximized on an industrial scale, and as income dried up, so the maintenance of planted collections became impossible, and Abney Park, like most other garden and arboretums cemeteries, tended to grow wild.[56]

CONCLUSION

The enthusiasm for new trees and arboretums was displayed in thousands of nineteenth-century public and private gardens. In 1843 Jane Loudon noted that arboretums were 'now so fashionable', not only for public pleasure grounds, wealthy individuals and institutions, but also for 'small villa residences', where 'an arboretum is the most effectual means of procuring a maximum of enjoyment in a minimum of space'. She emphasized that although the most common arrangement of an arboretum was the natural system, labelled arboretum plants might be:

> placed together according to the countries of which they are natives … the soil in which they grow; or according to their sizes and habitats, or time of leafing, or flowering.[57]

Arboretums were one of the most important developments in British, and ultimately global, landscape gardening during the nineteenth century. They demonstrate the continuing innovation in British horticulture and gardening after the Georgian period and the importance of the challenges provided by urbanization and industrialization. For horticulturists such as Loudon and Sinclair, strolling within an arboretum was a very active experience like a wonderful panorama, an excursion around the globe providing rational recreation, aesthetic enjoyment, and refinement and botanical learning in one place. These windows across the world tended to be formed in particular contexts such as country estates, botanical society gardens, commercial nurseries, public parks and cemeteries. Analysis of these shows the depth and complexity of symbolism and meaning engendered by these places and demonstrates some of the relationships between social and cultural contexts, design principles and their attempted realization, organic agencies, audiences, consumption and change. In these circumstances the character and usage of arboretums were often determined by competing social and cultural factors as much as design plans and promoter intentions, reflecting tensions such as those between elite exclusivity and control, on the one hand, and popular access and community expectations, on the other. Nonetheless, each time the Victorians and Edwardians strolled in a public arboretum or gazed upon the small arboretums of their private plots, they reaffirmed a beautifully ordered conception of nature, whilst partaking of the triumphs of science, commerce and exploration, conquest and empire.

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[7] Loudon took up the idea during the 1830s, little using the term 'arboretum' before. In 1812, for instance, although he carefully defined the differences between groves, woods and plantations, arboretums were not mentioned; *Hints on the Formation of Gardens and Pleasure Grounds* (London: John Harding, 1812), pp. 31–2. Similarly, in the third book on arboriculture in the *Encyclopaedia of Gardening* (London: Longmans *et al.*, 1830), arboretums are not separately categorized and the term is hardly used except to report the

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BERYL HARTLEY

SITES OF KNOWLEDGE AND INSTRUCTION: ARBORETUMS AND THE *ARBORETUM ET FUTICETUM BRITANNICUM*

The paper argues that the name John Claudius Loudon gave his great encyclopaedia of trees and shrubs was intended to convey much more than his stated purpose of increasing the varieties being grown and of promoting a taste for arboriculture. It considers what arboretums were for, why Loudon campaigned for them to be planted and why those established during his lifetime failed to achieve all his desired criteria. The paper also compares these living collections of trees with Loudon's paper arboretum and highlights his attempt to overcome the most obvious limitation of his work – not being able to study and compare the trees themselves – by commissioning the four volumes of tree portraits drawn to scale from nature. These stood in for the trees, performing a task similar to that of the naturalist George Cuvier's paper museum of fossil bones.

THE *ARBORETUM ET FUTICETUM BRITANNICUM*

> Before trees can be introduced, it is necessary that they should be known, their uses, appearance, culture, propagation, etc; and this is the object of *Arboretum Britannicum* to effect.

With these words John Claudius Loudon announced in the *Gardener's Magazine* in 1830 the forthcoming publication of his encyclopaedia of trees and shrubs, arranged according to the natural system of plant classification.[1] It eventually appeared in parts between 1835 and 1838, and finally in eight volumes, four of which contained four hundred scale portraits drawn from nature – a unique addition to such a work and intended to facilitate comparison (Figure 1). The *Westminster Review* hailed it as 'a standard work which … must rank as the highest authority existing' and the *Quarterly Review* thought it 'worthy of a place in the library of every landed gentleman, as well as every student of botanical, arboricultural and horticultural science', while the Duke of Bedford endorsed it as 'valuable and interesting'.[2] Nevertheless, it made a loss, primarily due to the huge cost of the portraits and other engravings, although Loudon also gave many copies to contributors, botanists and institutions, signifying his confidence in the work.[3] Had he called it *Encyclopaedia of Trees and Shrubs*, following his four other successful encyclopaedias, it might perhaps have proved another winner, instead of bringing him to the verge of bankruptcy and no doubt hastening his death.[4]

In the Preface Loudon states that he hopes the *Arboretum Britannicum* will increase the variety of trees being grown and promote a taste for arboriculture.[5] However, its

Faculty of Modern History, University of Oxford, c/o 10 Jeune Street, Oxford OX4 1BN, UK

ARBORETUM ET FRUTICETUM BRITANNICUM;

THE TREES AND SHRUBS OF BRITAIN,

By J. C. LOUDON, F.L. & H.S., &c.

IN EIGHT VOLUMES:

VOL. I.

LONDON:

PRINTED FOR THE AUTHOR,

LONGMAN, ORME, BROWN, GREEN, AND LONGMANS,

JAMES RIDGWAY AND SONS.

Figure 1. Title page of the first volume of John Claudius Loudon's *Arboretum et Fruticetum Britannicum* ... (London, 1838)
All figures, unless otherwise stated, are taken from publications owned by the author

title announces it as a comprehensive record of all the trees and shrubs then growing in Britain – sometimes also referred to as 'the British Arboretum'.[6] Containing up-to-date botanical figures, diagnoses, nomenclature and description, with a huge amount of information about each species, and with the scale portraits standing-in for the living trees, Loudon's paper arboretum was more complete and exemplary – at least in his eyes – than any existing arboretum – although he never ceased to hope, and strive for, the perfect example.

Loudon seems to have first used the word 'arboretum' in 1806, in a discussion of botanic gardens, where, he says, one may be planted, along with a fruticetum and herbarium, either in beds arranged by the Linnaean system, or in 'irregular masses' according to the natural system.[7] The latter system's emphasis on the study of living plants suggests why Loudon was so interested in arboretums and in the 1820s he began a campaign to encourage people to plant them, the significance of which can hardly be overstated. It also reflected his strong interest in botany. After being appointed a Fellow of the Linnean Society in 1806, Loudon associated with many eminent botanists and published botanical works; he continually urged planters and gardeners to study the subject to improve their knowledge of trees.[8] Concern to stabilize the classification and nomenclature of trees arose from experiencing for himself the problems created by the lack of consensus on species and varieties among botanists, commercial growers and others.[9]

DISTINGUISHING AN ARBORETUM FROM A COLLECTION

Loudon never defined an arboretum directly, but his criteria for one emerge from his various discussions and are pretty close to those for any botanic garden, adapted for ligneous plants: it should contain all the trees and shrubs hardy in the climate of Britain, arranged according to the natural system; its layout should allow easy access throughout the year; the trees should be disposed in a manner conducive to encourage scientific study and practical instruction; 'To answer the ends of an arboretum' sufficient space should be available for each species to attain its full size and character.[10] He emphasized the importance of preserving and disseminating seeds and plants of rare species, a significant and expected function of botanic gardens.[11]

In 1838 Loudon listed more than one hundred 'Arboretums or considerable collections', without, however, differentiating between them; he also included many foreign arboretums, several embryonic British ones, as well as pinetums and salictums.[12] Very few would have contained even the minimum of two thousand five hundred he had thought 'requisite to form an Arboretum Britannicum' in 1831.[13] A collection, however, might simply be a representative selection of indigenous and/or introduced species, or, perhaps, a botanical arrangement of one genus; it would not need to encompass all hardy tree species or follow a scientific arrangement. Loudon's somewhat overzealous use of the term suggests a reluctance to discourage landowners or nurserymen from planting a complete arboretum by appearing to denigrate their first steps in that direction. Since he evidently found the distinction tricky, recent confusion is perhaps not surprising. One historian, without providing any evidence, refers to Bishop Compton's renowned early collection of exotic trees – he died in 1741 – as 'probably the first British arboretum', and also applies the term to the Duke of Argyll's collection.[14] However (to the author's knowledge) it has never been used in relation to these or any other eighteenth-century exotic collections – for instance by Peter Collinson, or Richard Pococke, who wrote about many of them. After visiting the Duke of Richmond's famous plantations at Goodwood, Sussex, in 1754, Pococke recorded 'thirty different kinds of oaks and 400

different American trees and shrubs which compose a wilderness and a fine wood cut into ridings', without mentioning any botanical arrangement, which, as a naturalist, he surely would have noted.[15]

While Loudon never called these collections arboretums, he did report that Kew had 'one of the very first that was formed in Britain' and later historians have taken him at his word, several describing an arboretum in the original 9-acre botanic garden *c.*1760, although there appears to be no contemporary evidence that this early tree collection – Sir John Hill recorded 488 hardy trees and shrubs in 1768 – was designated an arboretum.[16] Both Kew and Edinburgh appear in Loudon's 1838 list of arboretums, but it is difficult to determine exactly when the term was first used in any meaningful way at either garden since neither had the space for a complete arboretum until 1845 and 1876, respectively. When, in 1825, Peter W. Watson thanked W. T. Aiton for allowing him access to 'the fine arboretum' at Kew,[17] it must have been in an embryonic state; the planting of a national arboretum at Kew, designed by William Andrews Nesfield and laid out by Sir William Hooker, was not begun until 1845 when around 200 acres were added to the existing garden (see Figure 5 on p. 17 of this issue). Loudon died in 1843 without knowing that his greatest wish for a really substantial London arboretum was to be realized.

A reference to an arboretum in the old Edinburgh Physic Garden in a Latin document of 1684 almost certainly only indicated a group of attractively arranged trees, although Loudon accepted this at its face value.[18] In 1835 he published a plan of the Botanic Garden – by then established in Leith Walk – received from the head gardener James McNab, the key to which includes an arboretum, although Loudon probably added this since the term does not appear on either of McNab's original plans of 1830 or 1873, on which he marked only 'collections' of trees.[19] The later plan shows that McNab had formed a large collection of *Coniferae*, but there was insufficient space for a complete arboretum in the Garden until the adjoining grounds of Inverleith House were added in 1876.[20]

TWO NINETEENTH-CENTURY ARBORETUMS: MAGNIFICENCE AND MEDIOCRITY

In the early 1820s Loudon recorded his views on two London arboretums: at Loddiges Hackney Nursery Garden and at the Horticultural Society's Chiswick garden. His admiration for the former was evident from 1826, when he wrote: 'There is no such collection of hardy trees and shrubs in the world; and when it is considered that they may all enter our plantations, their value to the country is incalculable'.[21] It was begun *c.*1820 by George Loddiges FLS, whose wide scientific interests no doubt account for the plants being arranged according to the Linnaean system.[22] Although Loudon advocated the natural system for arboretums, he endorsed Loddiges as 'a magnificent example' and was especially enthusiastic about its design and wide range of trees. In 1838 he reported that other nurserymen were emulating Loddiges in forming arboretums.[23] A plan and a full description appeared in the 1835 edition of Loudon's hugely popular *Encyclopaedia of Gardening* (see Figure 6 on p. 18 of this issue).[24]

Certainty of obtaining the desired species explains why so many important gardens purchased trees from Loddiges.[25] Figures 2 and 3 are portraits of saplings growing there, drawn by the landscape painter Henry le Jeune for *Arboretum Britannicum*; the aspen (*Populus tremula pendula*) Loudon pronounced a 'distinct variety', while the black birch (*Betula nigra*) was introduced by Collinson in 1736.[26] However, 7 acres were insufficient for all the trees to attain their natural size, and Loudon was soon lamenting that many 'have got so large they have had to be cut down'. Removing trees prematurely meant that

Figure 2. Young aspen (*Populus tremula pendula*), 14 feet high, in Loddiges Hackney Arboretum, by Henry le Jeune; from Loudon, *Arboretum et Fruticetum Britannicum*, VII, p. 218
The plant nomenclature used in all the captions is as it appears in Loudon's publication

Figure 3. Young black birch (*Betula nigra*), 26 feet high, in Loddiges Hackney Arboretum, by Henry le Jeune; from Loudon, *Arboretum et Fruticetum Britannicum*, VII, p. 234

named species could not be studied throughout their life cycle, nor could their seeds be gathered for dissemination.[27]

In contrast to Loddiges exemplary arboretum, the Horticultural Society's, begun *c.*1823 on about 8 acres, regularly roused Loudon to fury. He declared the 1827 plan 'so bad that it cannot be improved on, but must be totally obliterated', urging its reformation as a belt with the trees arranged according to the natural system; in 1829 he was 'astonished that such an absurdity could be produced in such an age in such a country' and later complained that the limited space prevented all species from 'attaining that magnitude and character which they ought to have to answer the ends of an arboretum'.[28] Loudon's own plan, which shows the arboretum surrounding the garden, was never adopted, but after George Gordon took charge in the 1830s his reports became more positive, and most of the young trees depicted for *Arboretum Britannicum* were growing there (Figures 6 and 10).

From the mid-1820s, in the *Gardener's Magazine* and elsewhere, Loudon made great efforts to encourage the establishment of private arboretums, suggesting that prizes should be offered for the 'most complete arboretum, arranged according to the natural system'.[29] In 1829 he advised Thomas Brooks on planting one at Flitwick, Bedfordshire,[30] which was greatly admired by James Forbes, head gardener at Woburn Abbey.[31] Brooks also planted a pinetum.[32] A collection of *Coniferae* is more manageable than a complete arboretum and Loudon encouraged the planting of pinetums, extolling as a model the one at Dropmore, Berkshire, the seat of Lord Grenville.[33] In 1838 he published a table of the principal pinetums of Britain and Europe.[34]

HOW TO PLANT AN ARBORETUM

Loudon's practical advice on planning and planting arboretums differs from his instructions for forming ornamental plantations, arboretums having the scientific purpose of displaying a complete named collection, while the first consideration in landscape gardening is effect.[35] Loudon was aware that to encourage visitors an arboretum should look attractive but it must, he said, be 'correct with reference to the affinities of the Orders'.[36]

Loudon at first recommended planting the trees on one or both sides of a winding walk – a 'complete arboretum' requiring at least two miles of walks' – but later advocated using one side only, allowing each species to be seen in sequence and without distraction.[37] The winding walk was not Loudon's invention but, since trees are not easy to display in formal beds, he recognized its advantages immediately on seeing it used at Loddiges, and afterwards always recommended this design. Along it the trees should be deployed to facilitate ease of access and comparison, each genus ideally being allocated sufficient space to accommodate all available species and varieties without touching, which would avoid any need for pruning; to estimate the space required the designer must know each species' mature height and shape.[38]

To assist a scientific arrangement Loudon published *Elementary Diagram for the Composition of Arboretums in Lines along the Margins of Walks* (1830) – a very large plate marked with continuous pairs of narrow parallel lines representing 'sixty-four zones of 295 ft each … calculated for containing all the … 2,512 species and varieties, contained in their Natural Orders and Tribes'. Names of the orders are printed on the zones, and evergreens are indicated by shading. This plate – which presents 'in a palpable form' the exact planting sequence along a walk – used in conjunction with a table of genera, giving their respective heights and whether deciduous or evergreen, appears extremely useful. Loudon also explains how the planting should be done.[39]

In 1835 he printed a list of trees available in London nurseries for planting an arboretum, with their prices; he described how to alter the soil to suit a particular genus and discussed trenching and manuring (to promote rapid growth at the start), as well as after-care of the trees – declaring that 'of scientific public gardens' arboretums are the least expensive to manage.[40]

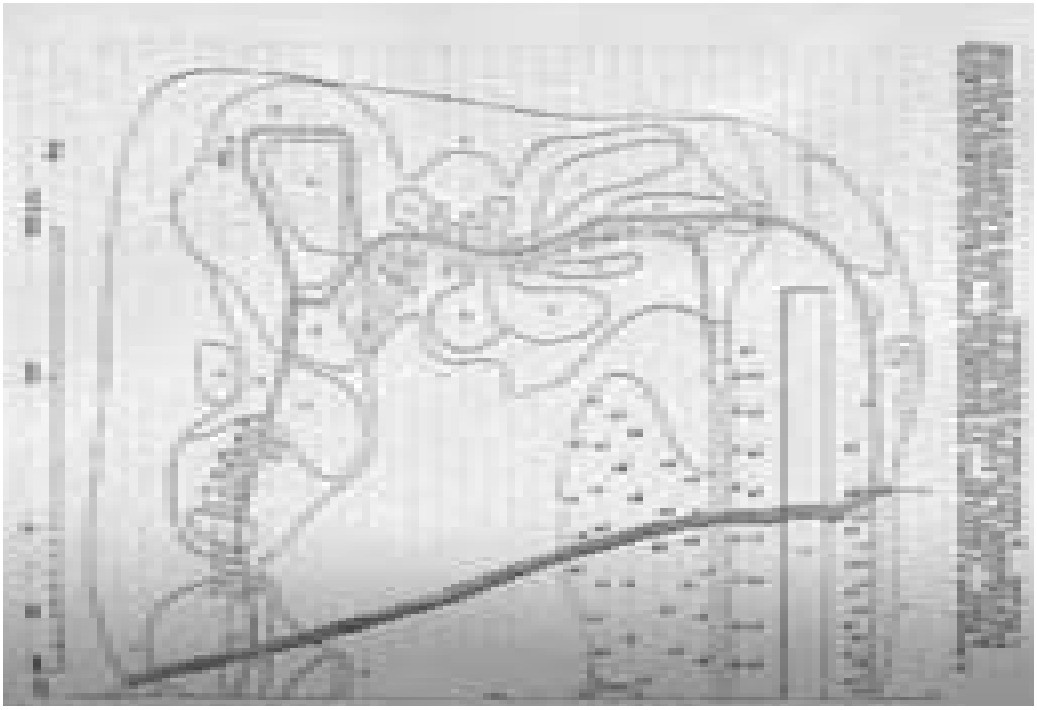
Loudon also showed by example how to plant an arboretum. In 1831 he designed and provided a planting plan for a botanic garden, including an arboretum, in Birmingham.[41] Visiting in 1839, he was 'highly gratified … especially with the growth of the trees and shrubs', attributing this mainly to the skill of their planting and management.[42] He planned *and* planted Derby Arboretum – the first created specifically as a public park – at the request of a local dignitary, enabling him to demonstrate how a botanical arrangement could work in this context and to express the hope that benefactors elsewhere might provide land and funds for others. Loudon operated under many constraints and the 11-acre, level site prevented him from achieving a perfect small arboretum, but he raised small hills to overcome the flatness and constructed winding walks among the existing straight ones. A complete catalogue of the trees and shrubs, their numbers recorded on a plan (Figure 4) to assist identification at the site, was produced for visitors, for whom a copy of *Arboretum Britannicum* was also made available; names were prominently displayed on brick tallies. Instructions for the arboretum's future management include the direction: 'no pruning whatsoever', although thinning was permitted. Loudon decreed that when a tree became too large it must be replaced with a young plant of the same kind, a height of 40–50 feet being 'sufficient for producing shade, and for showing the form and character of the tree, and its flowers and fruit, and nothing more is required, or can be admitted in an arboretum on so limited a piece of ground'. Overgrown common trees must be removed to prevent them eventually destroying the finer kinds. He warned that adding new species would require the entire arboretum to be replanted. All this information, and the plan, also appeared in the *Gardener's Magazine*.[43]

THE PROGRESS OF LOUDON'S CAMPAIGN: SUCCESSES AND LIMITATIONS

Loudon's greatest wish was for really spacious arboretums, to allow 'each tree to attain its full size and introducing every hardy tree … produced in the London nurseries',[44] which very few landowners could accommodate, or afford. However, his frequent and blatant hints in the *Gardener's Magazine* to the dukes of Devonshire, Northumberland and Bedford met with some success.[45] Loudon finally got his wish at Chatsworth, although on a smaller scale than anticipated. In 1835 Joseph Paxton, the Duke of Devonshire's head gardener, who had trained in the Horticultural Society's arboretum, sent Loudon a report and plan of his newly planted arboretum for the *Gardener's Magazine* (Figure 5). Paxton had arranged the trees, which he listed, in their natural orders along both sides of a mile-long circuitous walk, covering about 40 acres. About 1,670 species and varieties of the planned two thousand had already been planted, 'at such distances as their habits of growth require'; the names would be on oak tallies, readable at 10 yards. Explaining that the arboretum had cost the Duke nothing, the proceeds of trees felled to accommodate the walk having paid for it, Paxton suggested that this might be emulated by other landowners.[46] This report – and the gratifying hint to others to follow the Duke's example – must have delighted Loudon.

The Duke of Northumberland, on the other hand, was obviously perfectly happy with his extensive, and famous, collection of trees at Syon, many planted by Lancelot 'Capability' Brown when he laid out the grounds between 1750 and 1760, including, as Loudon recalled, 'all the foreign trees and shrubs that could be procured … in the London nurseries'; of which

Figure 4. 'Plan of the Derby Arboretum, 1840', by John Claudius Loudon; from *Gardener's Magazine*, 16 (1840), p. 522. Courtesy: Lindley Library, Royal Horticultural Society



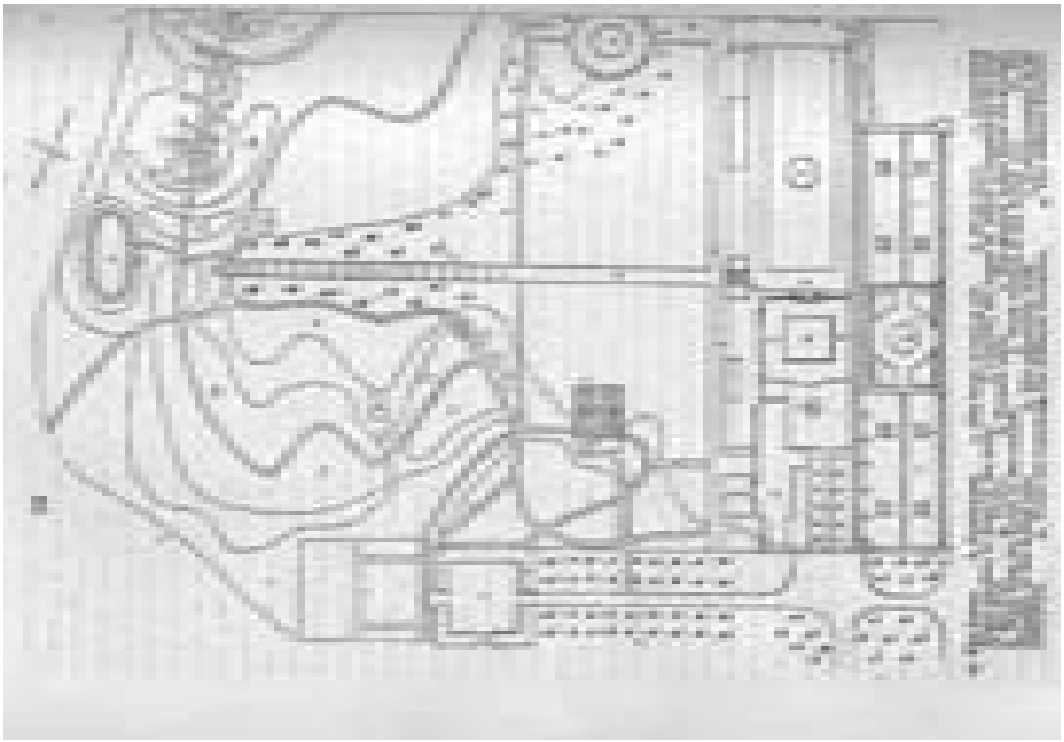


Figure 5. Plan of the arboretum at Chatsworth, Derbyshire, by Joseph Paxton. The arboretum, arranged along the narrow walk which almost encircles the entire area, includes a pinetum (top right); from *Gardener's Magazine*, 11 (1835), pp. 388–9. Courtesy: Lindley Library, Royal Horticultural Society

'many very fine old specimens of cedars, pines, planes, gleditschias, robinias, catalpas and … deciduous cypress' still remained.[47] For the *Arboretum Britannicum*, which Loudon dedicated to him, however, the Duke paid all the costs of having portraits of thirty-seven mature trees drawn by the landscape painter George R. Lewis, and a few by others, including William Andrews Nesfield, who later designed the national arboretum at Kew. Lewis's depiction of a mature Cedar of Lebanon at Syon, planted in Brown's time, is shown, as in *Arboretum Britannicum*, with a sapling of the same species in the Horticultural Society's Garden, drawn by Henry le Jeune (Figures 6 and 7).[48]

The Duke of Bedford already had a fine salictum at Woburn, containing, Loudon reported, 'the most complete collection of … willows in the world'.[49] Their utility attracted the Duke, who sent a collection to the Goldsworth Nursery to stimulate interest.[50] In 1833 James Forbes started an arboretum along a winding walk at Woburn.[51] But the pinetum, begun with seeds sent by Lord Grenville from Dropmore, seems to have taken priority and Loudon printed Forbes's catalogue of its trees and the Duke's introduction to it – in which he explains his interest in conifers – rendering a privately printed work of potential value to others more widely available. Loudon also compared the species and varieties in *Pinetum Woburnense* with those in *Arboretum Britannicum*, and other works, pointing out and discussing differences in nomenclature and classification.[52]

By 1835 Loudon appeared to recognize that the achievement of his greatest wish – for a large arboretum of 100–150 acres in London – was unlikely, and that he must suggest other, less demanding, alternatives. He observed that 'much may be done in ten, twenty or thirty acres', and urged such plantings in public gardens, although an 'entire garden, park or promenade could be planted as an arboretum'. He also proposed the formation of 'monogeneric arboretums' on estates near London, adding that even suburban gardens could contain smaller ligneous plants. Regular study of such collections by botanists and gardeners would result in 'great accuracy in nomenclature', and any ripened seed could be distributed. A list of species suitable for a small arboretum, with prices in the London nurseries, was included as further encouragement and to show the correct nomenclature, since 'no two nurseries apply the same names to the same things'; he added that two hundred and fifty to three hundred trees of the smallest sizes purchasable would form 'a very complete arboretum' costing only £25 or £30.[53] In 1840 he declared that an arboretum – or at least a named collection – might become 'as essential to a gentleman's country residence, as a flower garden'.[54] Although this seems unlikely, it is remarkable what his cajoling and suggestions in the *Gardener's Magazine* achieved. He must have been delighted when, in 1838, the Royal Society of Horticulture and Agriculture began offering Gold Medals for the best new arboretums.[55]

SITES OF KNOWLEDGE AND INSTRUCTION

The first arboretums were arranged alphabetically by genera, according to the Linnaean system, but this separated related genera, hindering comparison, whereas it was assisted by the family groupings of the natural system.[56] While John Lindley, Professor of Botany at University College, was the foremost advocate of the natural system in Britain, Loudon also contributed greatly, through the *Gardener's Magazine* and his other publications, to its wider acceptance among practitioners, who by the 1820s had clearly begun to recognize the benefits of arranging plants in their natural orders.[57] The emphasis of the natural system on the study of living plants no doubt explains the burgeoning interest in arboretums at that time; it also encouraged more informal designs, which were better suited for displaying trees and, therefore, for communicating knowledge about them – although this would, of course, have been limited by what was available.

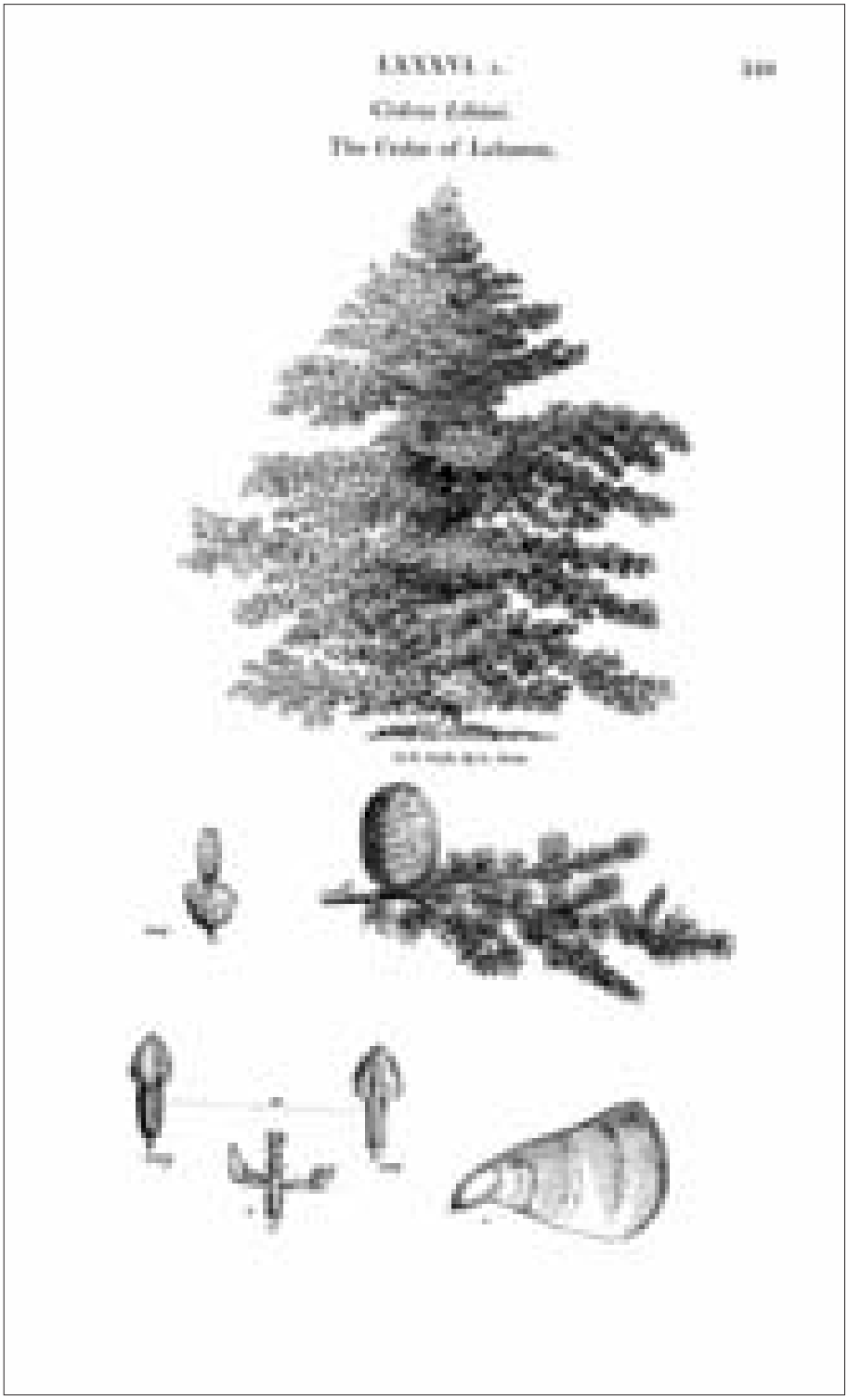


Figure 6. Young Cedar of Lebanon (*Cedrus Libani*), 15 feet high, in the Horticultural Society's Garden, by Henry le Jeune; from Loudon, *Arboretum et Fruticetum Britannicum* VIII, p. 348

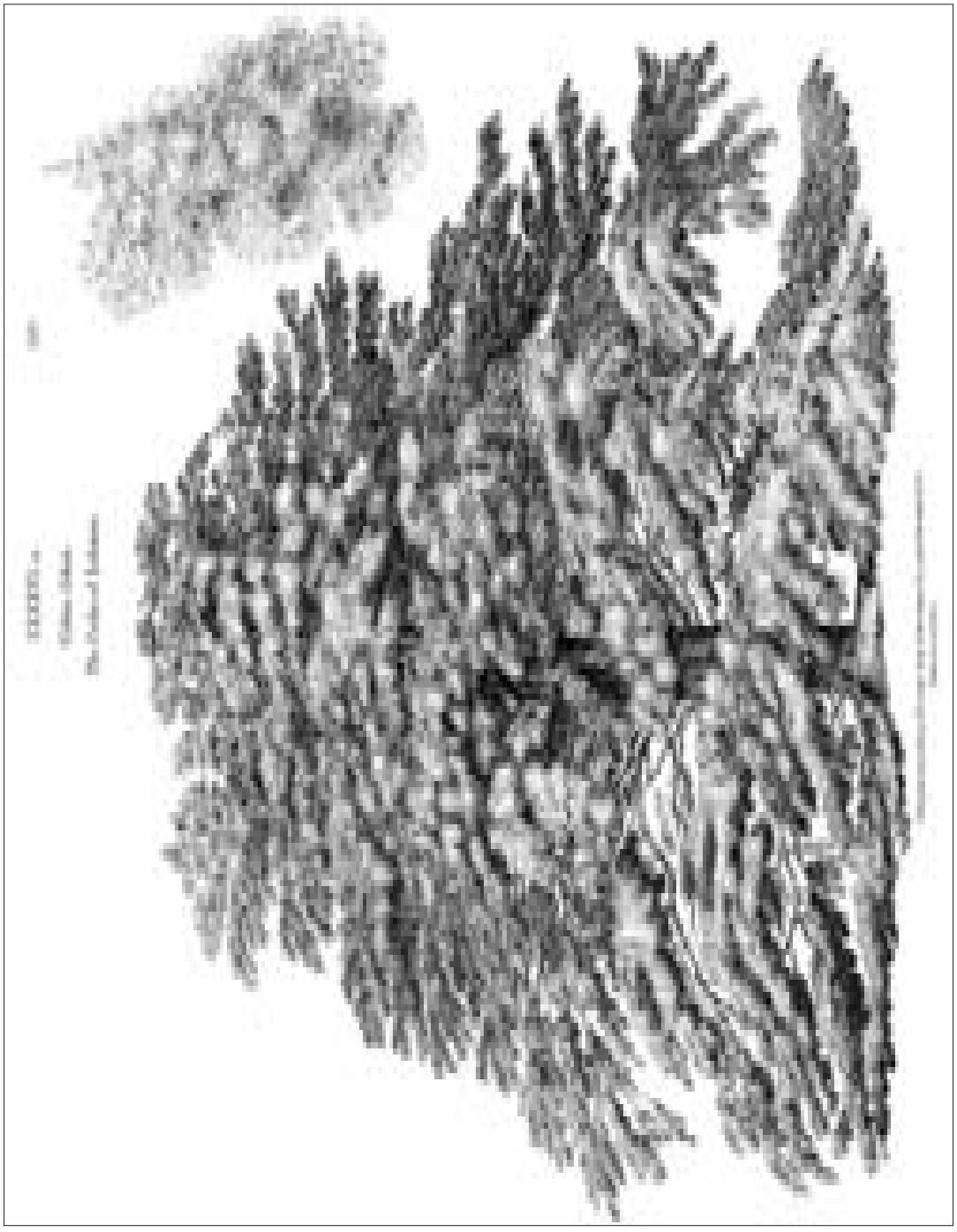


Figure 7. Mature Cedar of Lebanon (*Cedrus Libani*), 72 feet high, at Syon, by G. R. Lewis; from Loudon, *Arboretum et Fruticetum Britannicum*, VIII, p. 349

While the value of an arboretum as a site of knowledge may depend in the first instance on the scientific expertise of the botanist determining its arrangement and his skill in discriminating between species and varieties, Loudon's discussions show that its ability to function properly at this level was also determined by other factors, such as its size and design, and the practical skills and experience of the gardener in charge. The visual display, as in all botanic gardens, is the result of much behind-the-scenes practical activity – patient trials with methods of propagation and cultivation, especially of exotics, for instance – which remain hidden but affect the end result. However, Lindley, who frequently stressed the close relationship between botany and horticulture, pointed out that under the natural system: 'the propagation or cultivation of one plant is usually applicable to all its kindred; the habits of one species in an order will often be those of the rest'.[58]

As a site of instruction, an arboretum's worth is measured in terms of its effectiveness in communicating, primarily visually, the knowledge embedded in it.[59] The names and origins of the trees must be prominently displayed to allow students or apprentice gardeners to memorize them – although Loudon warned in 1822, 'to know the name of an object is not to know its nature' – and to learn the essential characters of each species by regularly observing and comparing them.[60] Study and instruction in the arboretum itself could be enhanced by access to dried specimens and botanical and practical works. In a wider context, an arboretum's reputation would depend on preserving and disseminating rare species and on forging links with similar establishments at home and abroad.

Arboretums were intended primarily for botanists, students and professional gardeners, but increasingly they were opened to the public, creating a potential conflict of interest among their users – the experts and the less informed.[61] This did not appear to concern Loudon, however. He hoped the casual glance of the latter might be transformed, if not into a scientific gaze, at least into one based on a real understanding of each tree's place in the scheme of things.

A NEW ROLE FOR *ARBORETUM BRITANNICUM*

Since, as has been seen, an arboretum large enough to contain a complete collection of every species must have appeared unattainable to Loudon, it seems likely that he came to regard his *Arboretum Britannicum* as an adequate substitute. Its title and arrangement and, in particular, its emphasis on the visual – after all, recognition and comparison depend on close observation – indicate that he intended the work to stand in for the real thing. Other similarities are apparent: both focus on living trees and on knowledge of each individual's status in the plant kingdom; the natural system enables each to avoid the usual alphabetical order by genus – ABIES to ULMUS. Loudon thought 'any work having pretensions to be scientific' should avoid an alphabetical arrangement.[62]

As a paper arboretum, however, the *Arboretum Britannicum* was more comprehensive than the living sort and this made it an invaluable site of knowledge and information about all the known hardy trees. Loudon also expected it to reach more people than could visit the few important collections or arboretums; a reviewer thought it particularly helpful to planters and practical men.[63] The work is an encyclopaedia, not a dictionary, which Loudon attacked as 'altogether unsuitable in the present advanced state of science', placing unconnected subjects together and separating those which should be together. An encyclopaedia, however, presents knowledge so that 'all those subjects which are most clearly allied in their natures are placed together, for connected perusal, and for illustrating each other'.[64]

In 1842, in his entry under 'Arboretum' in William Brande's *Dictionary of Science, Literature and Art*, Loudon was still asserting that 'there ought to be sufficient room for each species and variety to attain something like its natural size and shape'.[65] The *Arboretum Britannicum*, however, provided optimum space and visibility for all the trees to be compared. Loudon also kept his paper arboretum up-to-date by using the *Gardener's Magazine* as a 'perpetual supplement' to record new species and changes in nomenclature, but living trees change continually leading to overcrowding in arboretums and forcing premature removal; they also require good management, like any other plantation – neglected trees being useless for conveying botanical knowledge.[66]

Of course, the *Arboretum Britannicum* falls short of a living one in the most important respect: the trees cannot be studied or compared as living organized bodies; learning about their structure and culture by observing and handling them is also precluded. However, Loudon aimed to broaden people's understanding of trees in every way: in 1828 he had declared that to know a plant means:

> knowing its rank in the vegetable kingdom, its structure, habits of growth, the climate and countries in which it abounds, its history in its wild state and domestic history … its culture, properties and uses.[67]

This encapsulates the *Arboretum Britannicum*'s main thrust, but the work also contains very full botanical diagnoses and descriptions – Loudon acknowledged the assistance of several botanists in its preparation – as well as specimens drawn by the respected botanical artist J. D. C. Sowerby FLS, to a scale of 2 inches to 1 foot, and printed with the portraits (Figures 3 and 6). Sowerby also provided scale drawings of some leaves to aid identification.[68]

Small symbols (Figure 8) denoting the general habit of growth of every tree are also included to facilitate swift recognition; Figure 9 shows how these are used for each genus – in this case QUERCUS. They immediately alert the reader to the fact that the genus includes both deciduous and evergreen species and encompasses all shapes and sizes.[69] Loudon also gathered information for the *Arboretum Britannicum* through the *Gardener's Magazine* and through thousands of questionnaires, on such things as the naturalization of imported trees, the dimensions of young and mature trees, which species grow successfully in different parts of Britain, the best soils and conditions for different species, and advice on propagating, planting and care.[70]

PORTRAITS OF THE LIVING TREES

The unique feature of the *Arboretum Britannicum* is its visual content. It contained the first systematic use of scale drawings of entire trees in a botanical work – four hundred specially commissioned scale portraits of young and mature living trees of each species, grouped together for comparison (Figures 2 and 3, 6 and 7, and 10 and 11), and innumerable others scattered throughout the text to illustrate particular points. Depictions of living trees in botanical works before this were rare: following Linnaeus, botanists and their artists concentrated on the reproductive parts and whole trees were of no interest.[71] The sheer size of trees also precluded their study in herbariums. However, the natural system's focus on the entire living plant rendered accurate scale depictions of living trees as valuable as botanical drawings for study and comparison. No wonder, then, that Loudon drew attention to the inclusion of the tree portraits when announcing his forthcoming encyclopaedia in the *Gardener's Magazine*.[72] In *Arboretum Britannicum* – where they are mentioned twice on the title page (Figure 1) – he explains that they are

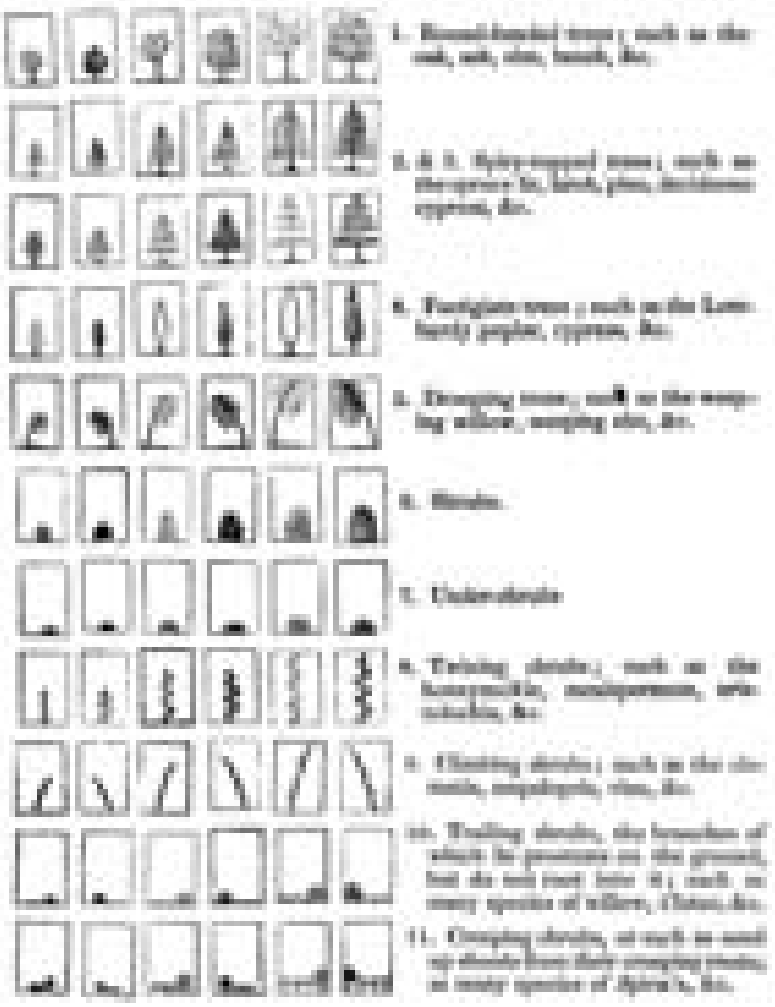


Figure 8. Symbols used by Loudon to show at a glance the general habit and size of the trees and shrubs described; from Loudon, *Arboretum et Fruticetum Britannicum*, I, p. xiii

Figure 9. Example of the use of these symbols for the genus *Quercus*, showing the range and size of deciduous and evergreen species belonging to this genus; from Loudon, *Arboretum et Fruticetum Britannicum*, III, p. 1717

intended: 'to give a palpable idea of the general magnitude, form and character which different species and varieties assume when growing in the same soil and climate.[73]

It is significant that the portraits were executed by landscape painters rather than botanical artists. The latter worked from fresh or dried specimens and were not equipped with the special knowledge and skills required to draw entire trees from nature. Some landscape painters, however, learned to *study* the trees they drew, and in the process developed and refined their visual and manual skills to allow them to emphasize general patterns of structure and growth rather than individual peculiarities.[74]

Most of the scale portraits in *Arboretum Britannicum* were commissioned by Loudon and all were drawn by landscape painters – some well known and others he supervised. Since they were intended primarily to communicate differences between species and varieties, he went to considerable trouble to confine the artists to essential characters. Both young and full-grown trees are represented: most of the ten-year-old trees were drawn at Loddiges or the Horticultural Society's garden (to a scale of 1 inch to 4 feet); the mature specimens mainly in or near London (to a scale of 1 inch to 12 feet). The latter were valuable because few specimens in contemporary arboretums were large enough to display their mature ramifications.

To facilitate comparison, each species' portraits appear together, often with several varieties. For instance, Figures 10 and 11 are of young and mature specimens of the black walnut, *Juglans nigra* – an early introduction from North America – which may be compared with the common species *J. regia* (Figure 12).[75] Loudon also used depictions of mature specimens to help resolve disagreements among botanists and others over species – for instance, the British oaks *Quercus pedunculata* and *Q. sessiliflora*. Distinguishing between them was important since the latter was believed to produce stronger timber. In the two portraits of mature specimens by H. W. Jukes (Figures 13 and 14), the difference between the spreading structure of *Q. pedunculata* and the more upright growth of *Q. sessiliflora* is emphasized by the trees being shown without their foliage.[76]

SOME IMPORTANT PARALLELS

These portraits were a new departure in such a work and helped to fill a gap in the knowledge of trees at the time; they are also valuable historical records of particular trees, mostly now gone. Unlike the living trees, these specimens remained stable, always available to be consulted and compared. They stood in for the trees themselves, and Loudon's careful identification of their locations confirms the extent to which the value of natural history drawings resides in their 'situatedness' – inviting verification and further study. In declaring that the portraits were intended to 'make a stronger impression on the mind of the reader', Loudon evidently understood the explanatory power of good drawings.[77]

Cuvier's paper museum of drawings and engravings of fossil bones, received from distant savants, acted, as Martin Rudwick has shown, as 'proxies', constituting a valuable resource which facilitated his studies in comparative anatomy. Although Cuvier was physically separated from the specimens, the depictions meant that he did not have to rely on written descriptions. He also used his own drawings in published papers to communicate his findings more forcefully to others.[78] The tree portraits in *Arboretum Britannicum* performed the same task for Loudon.

Loudon identified the locations of all the trees featured in these portraits, not just to prove that they had been drawn from nature, but to encourage his readers to find and perhaps observe them over time, comparing them with other species or with varieties. They could see the young trees arranged according to the Linnaean system at Loddiges

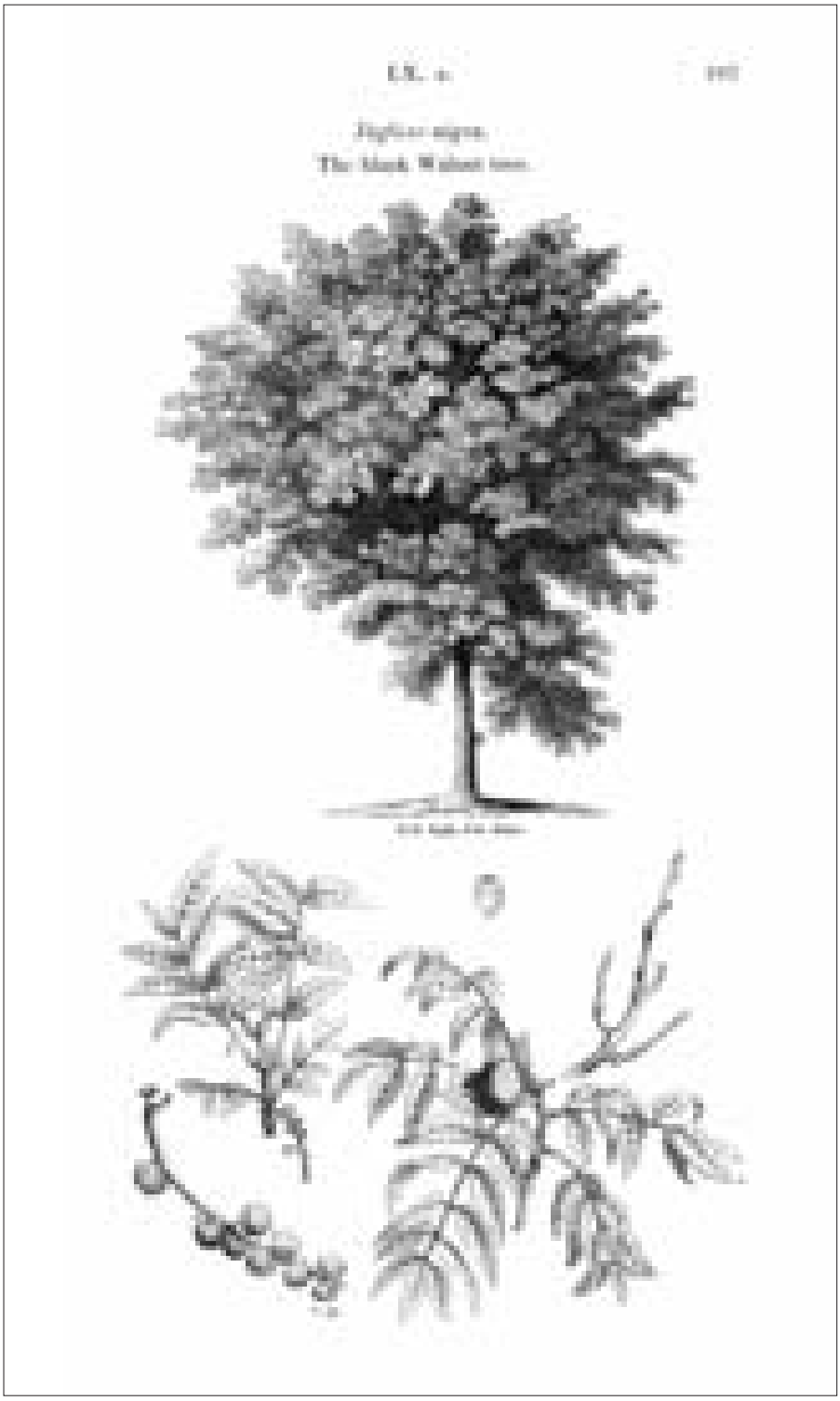


Figure 10. Young black walnut (*Juglans nigra*), 15 feet high, in the Horticultural Society's Garden, by Charles Rauch; from Loudon, *Arboretum et Fruticetum Britannicum*, VII, p. 197

Figure 11. Mature black walnut (*Juglans nigra*), 59 feet high, at Syon, by G. R. Lewis; *Arboretum et Fruticetum Britannicum* VII, p. 197a

Figure 12. Mature royal or common walnut (*Juglans regia*), 54 feet, at Chiswick Villa [House], by William Andrews Nesfield; from Loudon, *Arboretum et Fruticetum Britannicum*, VII, p. 195a

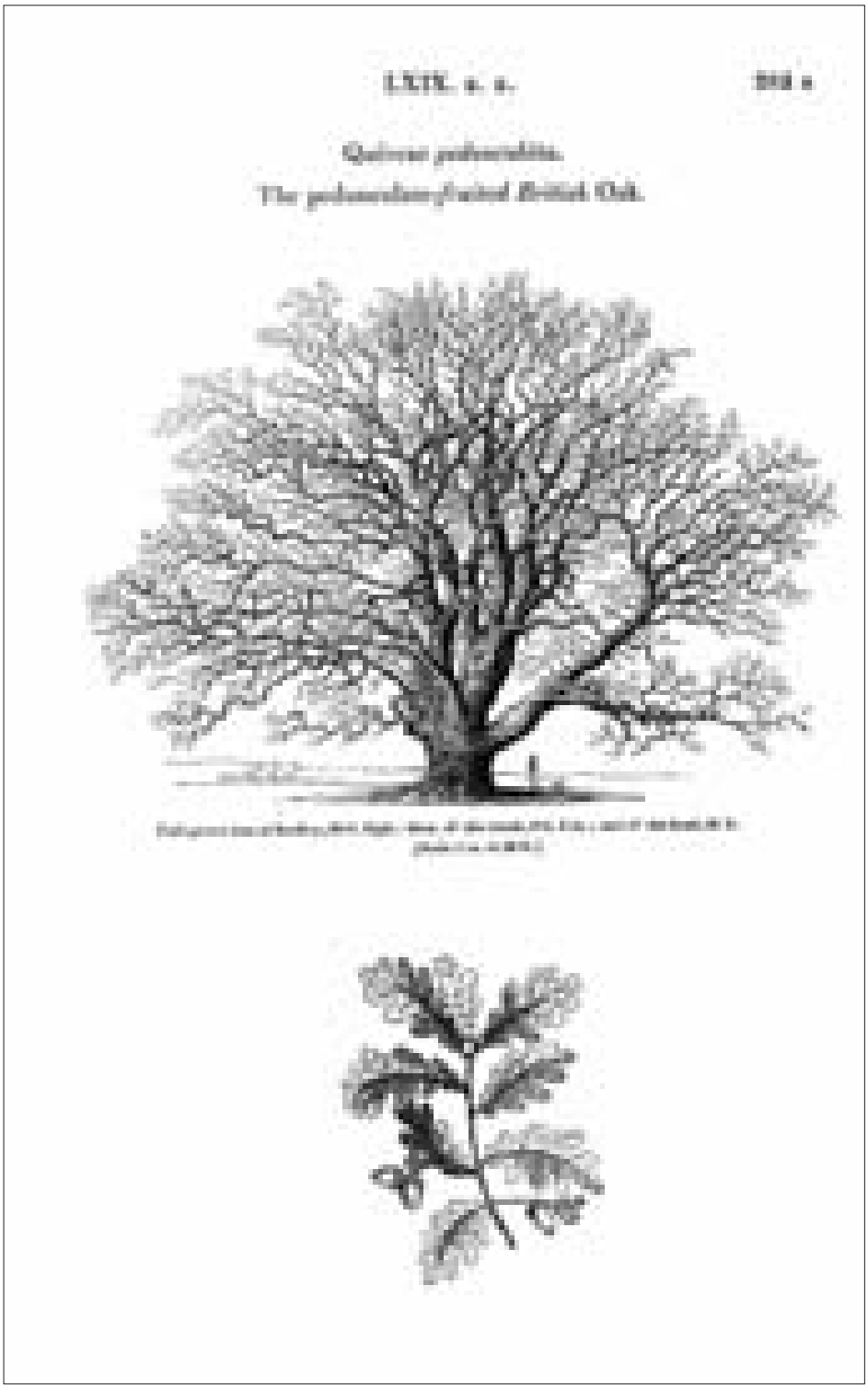


Figure 13. British oak (*Quercus pedunculata*), 80 feet high, in Studley Park, by H. W. Jukes; from Loudon, *Arboretum et Fruticetum Britannicum*, VIII, p. 282a

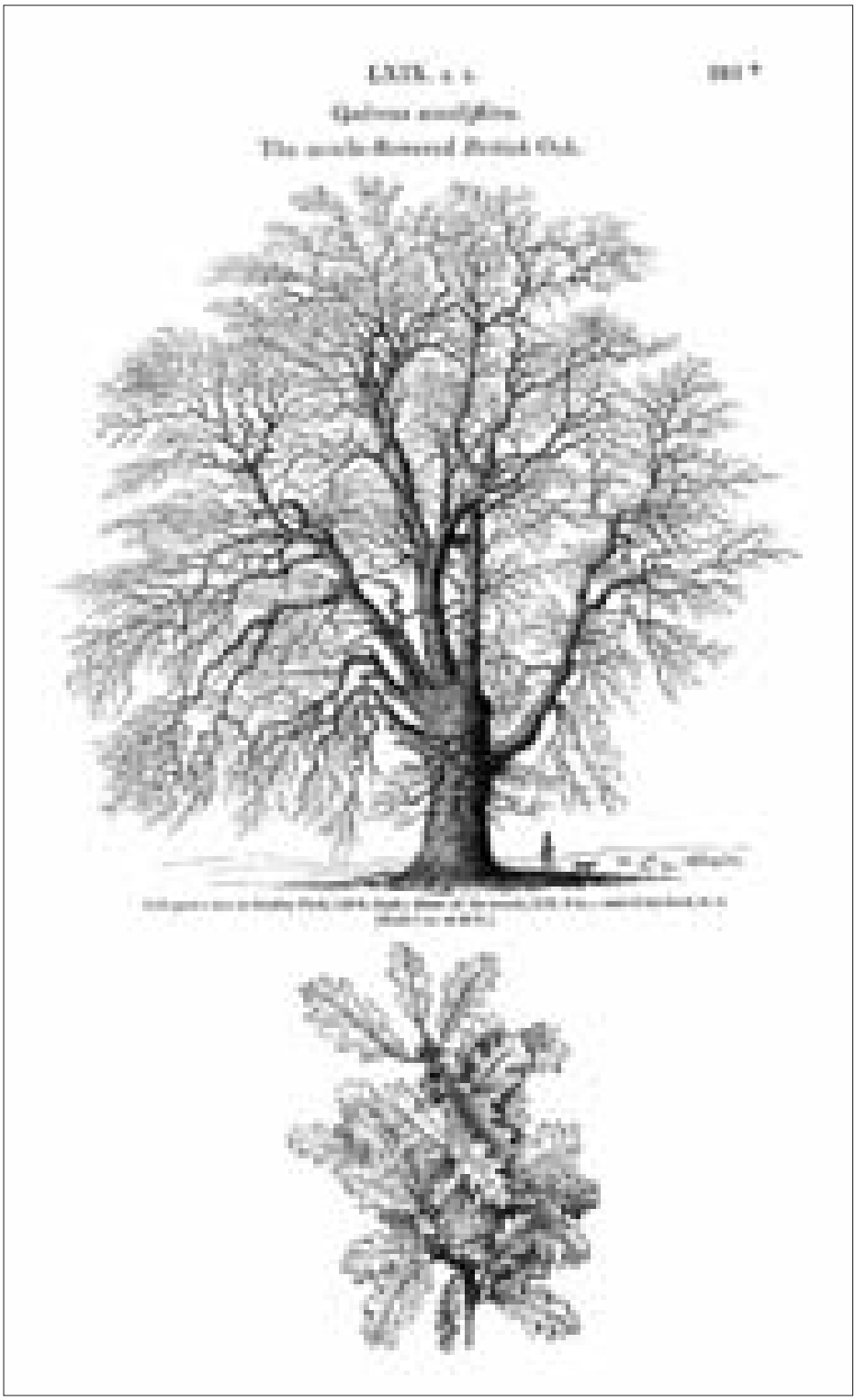


Figure 14. British oak (*Quercus sessiliflora*), 118 feet high, in Studley Park, by H. W. Jukes; from Loudon, *Arboretum et Fruticetum Britannicum*, VIII, p. 281*

arboretum, or growing in their natural orders at the Horticultural Society's garden. While arboretums were Loudon's preferred sites of learning, there were few, if any, full-grown trees at these two small gardens, so to show each species at a later stage of its life cycle he had to use drawings of mature trees in other collections; being included in Loudon's paper arboretum conferred on these trees a status beyond what they possessed in their original habitat, just as inclusion in Cuvier's paper museum endowed drawings from across the world with greater significance.

The aims of arboretums and the *Arboretum Britannicum* were essentially the same: to encompass the contemporary state of knowledge of trees; to display, in a botanical arrangement, as many named species and varieties as possible to the greatest advantage to aid comparison; to instruct others to recognize, identify and name trees correctly and understand their cultivation; and to encourage more variety in gardens and parks. Loudon's paper arboretum presents an ideal: at that time, only in this form could Loudon's dream of a complete arrangement of hardy indigenous and naturalized trees be achieved.

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[1] '*Arboretum et Fruticetum Britannicum*', *Gardener's Magazine*, 6 (1830), p. 582.

[2] *Westminster Review*, 35 (1841), p. 441; *Quarterly Review*, 62 (1838), p. 332; Duke of Bedford, *Pinetum Woburnense* (1839), quoted in *Gardener's Magazine*, 15 (1839), p. 265.

[3] Archive of Longman, Orme, Brown, Green & Longmans (Loudon's publisher), Reading University: Common Ledgers B5-8 1835–48. See also Jane Loudon's memoir of Loudon in *Self-Instruction for Young Gardeners* (London, 1845), pp. ix–li.

[4] An abridged edition with this title, and minus the portraits, was published 1841–44 in ten parts and complete, the proceeds – as with those on all his other works – being retained by Longmans against his debt (Longmans archive, Reading University).

[5] *Arboretum Britannicum*, I, p. v.

[6] *Arboretum Britannicum*, I, dedication; *Gardener's Magazine*, 7 (1831), p. 360.

[7] John Claudius Loudon, *A Treatise on Forming, Improving and Managing Country Residences* (London, 1806), I, p. 343. Although Melanie Simo, *Loudon and the Landscape* (New Haven and London: Yale University Press, 1988), p. 57, gives the impression that he planned an arboretum for the Earl of Mansfield at Scone Palace in 1803, the Scone Palace archivist has recently informed me that neither Loudon's *Treatise on the Improvements Proposed for Scone* (1803), nor the plans which accompanied it, to which Simo refers, contain the term 'arboretum'; he only mentions 'plantations'.

[8] These included Joseph Banks, John Lindley and Augustin-Pyramus de Candolle. Loudon had studied botany and agriculture at Edinburgh University; *Encyclopaedia of Plants* (London: Longman, Orme, Brown, Green & Longmans, 1829) and *Hortus Britannicus* (London: Longman ..., 1830), which he edited. On studying botany, see Loudon, *Treatise on Forming, Improving and Managing Country Residences*, p. 468; *Encyclopaedia of Gardening* (London: Longman ..., 1822), pp. 140–1; and *Gardener's Magazine*, 6 (1830), p. 294.

[9] For instance, *Gardener's Magazine*, 11 (1835), p. 568.

[10] *Gardener's Magazine*, 6 (1830), p. 334; ibid., 7 (1831), pp. 360–1; *Arboretum Britannicum*, I, pp. 129–30.

[11] See his criticisms of the Horticultural Society and Kew Gardens for failing to do so, leading to the loss of rare species; *Gardener's Magazine*, 2 (1827), p. 315.

[12] *Arboretum Britannicum*, IV, general index, p. 2673; also ibid., I, pp. 127–32.

[13] *Gardener's Magazine*, 7 (1831), pp. 360–1.

[14] Ray Desmond, *The History of the Royal Botanic Gardens* (London: Harvill, 1995), pp. 169–70.

[15] Linnean Society, Collinson MSS; *Pococke's Tours 1754–1756*, p. 111.

[16] *Arboretum Britannicum*, I, p. 75; John Hill, *Hortus Kewensis* (London, 1768). For references to an early arboretum, see John Smith, *Records of the Royal Botanic Garden Kew* (London, 1886), pp. v–vi, 258; John Simmons, 'The history and development of the arboretum at the Royal Botanic Gardens, Kew', *Arboricultural Journal*, 5 (1981), pp. 173–88; Desmond, *History of the Royal Botanic Gardens*, p. 39, and on the key he added to a 1763 plan (pp. 46–7), although the original has no key (British Library, K.Top.40.46m).

[17] Peter William Watson, *Dendrologia Britannia* (London, 1825), p. xi.

[18] Robert Sibbald, *Scotia Illustrata*

(Edinburgh, 1684). A Latin scholar the author consulted says it is unlikely that Sibbald meant a botanical arrangement, although the phrase used is slightly ambiguous; classical Latin dictionaries give the meaning as 'a place grown with trees'; *Arboretum Britannicum*, I, p. 86.

[19] Loudon, *Encyclopaedia of Gardening* (London, 1835), p. 353; see the Preface, p. vi, for his acknowledgement of McNab as the source of the plan, presumably taken from the large original of 1830, held, with the 1870 original, in the Royal Botanic Garden Edinburgh (RBGE) archives. John Hutton Balfour used the latter as the frontispiece to his *Guide to the Royal Botanic Garden, Edinburgh* (*c*.1873).

[20] I am grateful to Leonie Paterson, archivist at the RBGE, for helping me understand the various stages of development of an arboretum at the Garden.

[21] *Gardener's Magazine*, I, p. 318.

[22] David Solman, *Loddiges of Hackney* (London: Hackney Society, 1995); on George Loddige, see pp. 62–6.

[23] *Arboretum Britannicum*, I, p. 131. Linnaeus based his system of classification on a study of the plants' sexual parts alone, whereas the natural system depended on a comprehensive assessment of their similarities and differences. John Claudius Loudon, *Gardener's Magazine*, 2 (1827), pp. 300–1; ibid., 6 (1830), p. 302; and *Arboretum Britannicum*, I, pp. 211–12.

[24] *Encyclopaedia of Gardening*, p. 1217.

[25] Including Chatsworth and Kew; Solman, *Loddiges of Hackney*, pp. 54ff.

[26] *Arboretum Britannicum*, III, pp. 1646, 1710.

[27] Ibid., I, p. 131. See also note 11.

[28] *Gardener's Magazine*, 2 (1827), pp. 359–400; ibid., 5 (1829), pp. 347–48; *Arboretum Britannicum*, I, pp. 129–30.

[29] *Gardener's Magazine*, 2 (1826), p. 238.

[30] Ibid., 5 (1829), p. 559; John Thomas Brooks, *The Diary of a Bedfordshire Squire*, ed. Richard Morgan (Bedford: Bedfordshire Historical Records Society, 1987), entry for 18 November 1829.

[31] *Hortus Worburnensis* (1833), p. 239.

[32] *Gardener's Magazine*, 19 (1843), pp. 641–2; Brooks/Morgan, *Diary*, December 1843.

[33] *Gardener's Magazine*, 3 (1828), pp. 263–69; ibid., 9 (1833), p. 646.

[34] *Gardener's Magazine*, 14 (1838), pp. 29–32.

[35] Loudon, *Treatise on Forming, Improving and Managing Country Residences*, pp. 465–8. On ornamental planting, see also *Encyclopaedia of Gardening* (1822), pp. 1072–130.

[36] *Hortus Britannicus* (1830), p. 491.

[37] Ibid., pp. 491–2; *Gardener's Magazine*, 11 (1835), p. 658.

[38] *Gardener's Magazine*, 16 (1840), pp. 542–3.

[39] *Illustrations of Landscape Gardening and Garden Architecture* (1830), pl. II and explanation (Sheet 4).

[40] *Gardener's Magazine*, 11 (1835), pp. 567, 658–9.

[41] *Gardener's Magazine*, 8 (1832), pp. 407–28 (plan on p. 410). Also Phillida Ballard, 'John Claudius Loudon and the Birmingham Botanical and Horticultural Society's gardens at Edgbaston: 1831–1845', *Garden History*, 8 (1960), pp. 66–73.

[42] *Gardener's Magazine*, 15 (1839), pp. 456, 537–9.

[43] John Claudius Loudon, *The Derby Arboretum* (London, 1840); *Gardener's Magazine*, 16 (1840), pp. 73–81, 521–45 (plan on p. 522). For a discussion of this arboretum, and much else about Loudon, see Simo, *Loudon and the Landscape*.

[44] *Gardener's Magazine*, 6 (1830), p. 334; *Arboretum Britannicum*, I, p. 129.

[45] *Gardener's Magazine*, 6 (1830), p. 334; ibid., 11 (1835), p. 361.

[46] *Gardener's Magazine*, 11 (1835), pp. 385–95.

[47] *Arboretum Britannicum*, I, p. 73. Brown, like other designers, used trees – including many foreign imports which were by then available in commercial nurseries – to create effects in his landscape gardens, not to form collections.

[48] *Arboretum Britannicum*, VIII, pls LXXXVI, LXXXVI A. The mature specimen, which fell over in the nineteenth century, but which was re-erected and lasted a few years, is now reduced to a stump (personal communication from Christopher Martyn, head gardener at Syon).

[49] *Gardener's Magazine*, 5 (1829), p. 562; described and catalogued by Forbes in 1829.

[50] *Gardener's Magazine*, 10 (1834), p. 330.

[51] *Hortus Woburnensis*, pp. 238–9.

[52] *Gardener's Magazine*, 15 (1839), pp. 263–75.

[53] Ibid., 11 (1835), pp. 567–70, 657–60.

[54] Ibid., 16, p. 75.

[55] Ibid., 14 (1838), p. 105.

[56] George Don, *A General History of the Dichlamydeous Plants* (London: J. G. Rivington *et al.*, 1831–38), I, p. iii.

[57] *Gardener's Magazine*, 2 (1827), p. 301.

[58] John Lindley, *An Introductory Lecture Delivered in the University of London* (London, 1829), p. 22; *idem*, *An Introduction to the Natural System of Botany* (London: Longman, Rees, Orme, Brown & Green, 1830), p. 77. Also *Arboretum Britannicum*, I, p. 111.

[59] Jan Golinski, *Science and Public Culture* (Cambridge: Cambridge University Press, 1992), p. 3: 'Claims to knowledge become accepted insofar as they are embodied in effective acts of communication'.

[60] *Encyclopaedia of Gardening*, p. 141. Also Lindley, *Introductory Lecture*, pp. 9–10.

[61] Foucault's term 'heterotopias' has been applied to such contested sites by Adi Ophir and Steven Shapin, 'The place of knowledge',

Science in Context, 4 (1991), pp. 13–14.

[62] *Arboretum Britannicum*, I, p. 211.

[63] *The Gardener's Chronicle* (14 August 1841), p. 832.

[64] *Encyclopaedia of Gardening* (1834 edn), new Preface, pp. iii–iv. Loudon credited Coleridge with this argument (Coleridge, Prospectus to the *Encyclopaedia Metropolitana*).

[65] William Brande, *Dictionary of Science, Literature and Art* (London: Longmans & Co., 1842), p. 71. Loudon is listed among the contributors and his style is instantly recognizable.

[66] *Arboretum Britannicum*, I, p. ix; *Encyclopaedia of Gardening* (1834), p. v.

[67] *Magazine of Natural History*, I, p. 1.

[68] *Arboretum Britannicum*, I, pp. viii–ix (botany), xiii, 223 (specimens). The leaf sprays printed with the tree portraits are by the same artists to show the 'touch' of each species (see note 74).

[69] *Arboretum Britannicum*, I, p. xiii; III, p. 1717.

[70] See *Gardener's Magazine*, 10 (1834), pp. 581–2, where Loudon says 'We have sent papers ... in French, German, and Italian, to all the botanic gardens of Europe; and, in English, to North America, and to upwards of a thousand country seats in Great Britain and Ireland'. In 1843 he requested further information for inclusion in a supplement to *Arboretum Britannicum*; *Gardener's Magazine*, 19 (1843), p. 125.

[71] Drawings of palm trees appear occasionally, but not drawn to scale. Even John Evelyn's *Sylva* contained no tree portraits until Alexander Hunter's edition of 1775, when he included drawings of two famous ancient oaks. After that, other works, also with a focus on the picturesque and noble qualities of ancient trees, appeared, among which Loudon most admired Jacob Strutt's *Sylva Britannica* (London, 1822–26) for the accuracy of his portraits and reproduced many as small figures in the text of *Arboretum Britannicum*. The scale portraits in *Arboretum Britannicum*, however, were intended to highlight the essential characters of each species, not their picturesque qualities.

[72] *Gardener's Magazine*, 6 (1830), p. 582.

[73] *Arboretum Britannicum*, I, pp. v–vi.

[74] On the special skills and experimental practices of drawing trees from nature, see Beryl Hartley, 'The living academies of nature: scientific experiment in learning and communicating the new skills of early nineteenth-century landscape painting', *Studies in History and Philosophy of Science*, 27 (1966), pp. 149–80.

[75] *Arboretum Britannicum*, VIII, pp. 197, 197a, 195; genus described in III, pp. 1420–40.

[76] *Arboretum Britannicum*, VIII, pp. 281*, 282a; text: III, pp. 1731–46, which also includes many scaled-down images.

[77] *Arboretum Britannicum*, I, p. v.

[78] Martin Rudwick, 'Georges Cuvier's paper museum of fossil bones', *Archives of Natural History*, 27(1) (2000), pp. 51–68; *idem*, *Georges Cuvier, Fossil Bones and Geological Catastrophes* (Chicago: University of Chicago Press, 1997), chs 2–5.

NUALA C. JOHNSON

NAMES, LABELS AND PLANTING REGIMES: REGULATING TREES AT GLASNEVIN BOTANIC GARDENS, DUBLIN, 1795–1850

After many years of lobbying the Irish parliament by the Royal Dublin Society, a botanical garden was finally established in 1795 on 16 Irish acres of ground in Glasnevin, Dublin. Over the next half-century plans were executed to develop a prestige scientific garden in the city. Promoting both botany and agriculture, the gardens developed indoor and outdoor collections and the arboretum formed an important element in the overall design of the gardens. The collections were ordered in a manner that would expose the science of botany as well as present a visually pleasing arrangement of botanical material. Central to the ordering of displays was a concern with classification, naming and labelling. There were debates over the efficacy of particular classificatory systems as well as the accuracy of naming individual plants and the provision of material labels. A collection without labels could easily become a collection without order and thus a scientific garden could quickly be rendered a pleasure or unscientific garden. In this paper some of the debates about the significance of labels, planting regimes, and names will be analysed with a view to exposing how the search for order was a finely balanced process that was regularly confronted by the vicissitudes of human agency, design preferences and 'natural' conditions.

Modern botanical gardens were born out of the concerns of the enlightenment and the extension of overseas empires, yet the concept of a *scientific* garden emerged earlier in the sixteenth century when university physic gardens developed, in Padua and Bologna for instance, as sites of medical knowledge.[1] They focused primarily on the cultivation of medicinal species and culinary herbs and trees played a relatively insignificant role in their design. It was not until the eighteenth century that the planting of arboreta began to take shape. The accumulation of exotic species from around the globe was also resonant with religious significance. The Garden of Eden, in Christian theology, was taken to signify original perfection and thus gardens began to be developed 'by man seeking, often, to recreate the half-remembered, half-imagined Paradise, and to remove God's curse from the ground'.[2]

The extension of overseas exploration provided one stimulus for the development of tree growing projects across Europe. The expansion of a formal and informal empire in nineteenth-century Britain prompted the proliferation of botanical gardens at home and abroad and marked the desire to gather together in one site nature's diversity. Gardens developed as spaces in which the relationships between science, the exotic, commerce and the aesthetics of design were negotiated. Overseas empires provided both a vehicle, and a site, for the development of networks of plant exchange and species introduction,

School of Geography, Archaeology and Palaeoecology, Queen's University, Belfast BT7 1NN, UK

while the gardens acted as spaces for the reciprocal representation, communication and circulation of knowledge between amateur and expert as well as empire and home.[3] In keeping with the enlightenment project to bring the globe into taxonomic coherence, plant collectors, botanists, university professors, and garden curators all sought to order the world along scientific lines; but the practices of botanical scientific collecting and exhibition were also informed by an aesthetic ordering of nature that conditioned and shaped tree selection and garden design.

While the Royal Botanic Garden Kew was central to the development of scientific authority and the regulation of identification and naming procedures, in Latourian vocabulary a 'centre of calculation',[4] regional gardens also exercised a key role in the cultivation of botanical science and in disseminating taxonomic knowledge. They created a micro-geography of plant variety that both whetted and satisfied a burgeoning popular desire for the exotic, and opened far-flung botanical territories to local audiences. Richard Drayton has reminded us that the very shock of the globe's botanical variety, made clear as the empire expanded, undermined earlier hopes that the botanical garden would contain all of nature's treasures. Instead the gardens of the enlightenment had to recognize that they could only contain a representative sample of plants and thus 'the ideal of the microcosm yielded to that of the map'.[5] Part of that map included the trees and shrubs of the globe and, although they were not the only exhibits in a botanical garden, they did form an important element in both the scientific and aesthetic education provided in these spaces. In this paper the early development of the arboretum at the botanical gardens in Glasnevin, Dublin, is examined with a particular emphasis on the role of naming and classifying in the overall design of the space.

FOUNDING THE ROYAL BOTANIC GARDENS AT GLASNEVIN, DUBLIN

The establishment of a botanical garden in Dublin was mooted for many years during the last decades of the eighteenth century. Promoting the idea was the Dublin Society (renamed the Royal Dublin Society in 1820, and hereafter RDS) and, in particular, influential members such as the Speaker of the Irish House of Commons, John Foster, and Samuel Hayes MP. Ireland's big landowners of the eighteenth century had begun to take an interest in the reforestation of their estates. Hayes, for instance, at his well-wooded lands in Avondale, Co. Wicklow, promoted tree planting through the publication of his book *A Practical Treatise on Planting, and the Management of Woods and Coppices* (Dublin, 1794).[6] Eventually, in 1795, the Irish parliament awarded a grant of £300 for setting up the first botanical garden on the island. It was closely followed by gardens at Trinity College, Dublin, Cork and later Belfast. The search for a site had begun in 1790 by a committee of seven, including Foster (Lord Oriel), and an estate of 16 Irish acres (27 statute acres) was chosen. It lay 3 miles north of Dublin city centre in Glasnevin village on the south side of the River Tolka. The land was occupied by a variety of owners, including the Church of Ireland's Christchurch Cathedral. They had leased it to the minor poet, Thomas Tickell, who had been appointed Secretary to the Lord Justices in Ireland in 1724. When the site was acquired by the RDS there already existed a large house (now the Director's house), and some trees. These included elms, willows, cedars of Lebanon and a double row of yews flanking what is known as Addison's walk (Figure 1). These yews are the earliest surviving trees on the site and are estimated to date from the 1740s.

The Society appointed Dr Walter Wade, an honorary member of the RDS since 1792, as Professor and Lecturer in Botany. Wade (MD, FRS, MRIA) was already an established medical practitioner and botanist, having published a *Catalogus systematicus Plantarum*

Figure 1. Addison's Walk, Royal Botanic Gardens, Glasnevin. Photo: author

indigenarum in Comitatu Dublinensi inventarum (A Flora of Dublin) in 1794.[7] In 1798 John Underwood, on the recommendation of Thomas Curtis, editor of the *Gardener's Magazine,* was appointed head gardener. He came from London but was thought to be originally Scottish. He assisted Wade in designing the garden and, by 1802, it was agreed that Underwood would be entirely responsible for superintending the garden and thus freeing Wade from the day-to-day supervision and enabling him to devote his time to lecturing on botany and making experimental studies. In return Underwood was paid an annual salary of £100 and £50 for two people to be employed under him.[8]

In the inaugural poster the garden was advertised as 'promoting scientific knowledge in the various branches of agriculture and planting, as well as to increase and foster a

taste for practical and scientific botany'.[9] It would act both as a space for the development of the scientific knowledge of plants as well as enhancing current farming practices and techniques. Given the significance of agriculture to Ireland's domestic economy, and the presence of a land-owning elite among the members of the RDS, it is not surprising the status awarded to the agricultural dimension of the garden.[10] As a consequence of this emphasis on agriculture the RDS did not initially intend to create an arboretum. The garden was to be laid out to best assist farmers, labourers and herdsmen in their agricultural occupations. However, it was eventually decided to include an arboretum, perhaps due to the influence of key personnel such as Foster and Hayes who had tree gardens on their own private estates.[11] Moreover, the RDS had encouraged tree planting more generally in the mid-eighteenth century as part of a broader desire to reforest Ireland, with the result that about twenty-five million trees were planted between 1766 and 1806.[12]

In the original plan the garden was divided into a number of different utilitarian categories including a cattle garden, a hay garden, an esculent garden as well as a Hortus Linnaeus. The latter was divided into three parts – Herbarium (herbaceous), Fruticetum (shrub) and Arboretum (tree) sections. Each plant was:

> to be arranged according to its Class, Order, Genus and Species, beginning with the first class and proceeding regularly to the last class of Cryptogamia, for which a separate Division of ground is to be allotted.[13]

Specific instructions also applied to the marking of individual plants:

> every plant is to have a painted mark affixed to it, which is to show – the number in the Glasnevin catalogue, – the class and order – the generic and specific name, all in black on a white ground, and the English name in red.[14]

The original plan also specified where the arboretum was proposed to be located, namely on the west and south sides of the ground. It was:

> to form a screen of about five or six perches wide, with a broad gravel way through the centre, and the grass kept as fine as a bowling-green; the trees are to be planted from twenty to thirty feet apart, and where there is a very delicate or choice species, two may be planted, lest one should fail; the intermediate spaces are to be filled with Fir, Larch, Laurel, Elm etc. for shelter, which are to be cut away when they come to interfere with the Linnaean plants, or are useless as nurses, always taking care that the nurses be as distinct in appearance as possible from the species they are planted to protect, as Deciduous for Evergreens, and *vice versa*.[15]

The garden embraced both the scientific and agricultural uses of botany and the Professor of Botany was charged with the delivery of lectures to educate young men in the art and craft of agriculture. He was also to provide:

> Lectures on Botany at large, to be given during the season when the generality of plants are in flower, for the better demonstration of the sexual system. And the professor [is] to be allowed to use the house and gardens for delivering them.[16]

The RDS requested in 1800 that separate catalogues of each part of the garden be made and printed.[17] Underwood had set about creating some interim catalogues,[18] and, finally, in 1804 a complete catalogue was published, the only full catalogue of the garden ever produced. It was arranged by listing all plants according to their Linnaean name, English

name, native country, time of flowering, and whether a plant was annual, biennial or perennial, shrub or tree. The catalogue comprised of one hundred and seventeen pages listing plants from Class I to Class XXIV and it amounted to over six thousand different species and varieties of plant.[19] Also included in the catalogue was Thomas Sherrard's plan of the gardens, dated 1800, which provided an early visual representation of the arrangement of the different sections of the garden and their planting regimes (Plate VIII).

The arboretum was formed mainly on the high ground along the western periphery of the garden and along a strip of land running westwards from the entrance gate. This served to screen a plot of land belonging to the garden which was not developed until later. According to the catalogue the planting comprised over two hundred species of deciduous trees and around thirty-three species of conifers. By Loudon's reckoning the pinetum at Glasnevin was the third oldest in Europe, being predated only by Kew (1760) and Dropmore (1796),[20] and although there were far fewer conifers than deciduous specimens, this reflects the fact that the great import of coniferous trees took place later in the nineteenth century.[21] In this initial planting of the garden the principal structure of the plot was laid down and on the eastern side of the garden a considerable amount of land was given over to meadow, hay and pasture lands. The interior of the space was reserved for beds suitable to agriculture as well as the outdoor herbaceous systematic arrangements. The limited number of glasshouses, near the entrance, contained the tender exotic collections of the garden.

CREATING ORDER: CLASSIFYING, NAMING AND LABELLING

Labelling plants was central to the botanical arrangements at Glasnevin. The sheer number of new specimens entering Britain and, in particular, botanical gardens required some system of organization. It has been estimated that there were ten thousand plant species known during Carl Linnaeus's life and that this had expanded to about sixty thousand by *c.*1845.[22] Having species easily identifiable and catalogued, and the garden arranged to be read, paralleled the idea of treating scientific museums as libraries. In her analysis of Victorian science museums, Sophie Forgan highlights the significance of literary analogies to the structuring of museum space. Museums, it was thought, could be consulted like an encyclopaedia. Mobile glazed cases, for instance, were likened to the 'leaves of a book'.[23]

Michel Foucault, in his discussion of the development of natural history, also sees naming practices and classification as central to the regulation of enlightenment science. He claims that:

> The documents of this new history are not other words, texts or records; but unencumbered spaces in which things are juxtaposed: herbariums, collections, gardens … grouped according to their common features, and thus already virtually analysed, and bearers of nothing but their own individual names.[24]

Zoological gardens similarly deployed textual motifs as 'print cultures viewed animals as books, turning menageries into living libraries of nature'.[25] While attempting to contain one of each animal species, menageries confronted the twin roles of being centres for scientific investigation and sites of national showmanship and ultimately national pride.[26] The desire to create a scientific garden at Glasnevin, as well as one beneficial to agriculture, made the clear identification and labelling of plants according to one of the dominant classificatory systems important to its creators. The initial preference was for the Linnaean sexual system, but natural systems found favour in the nineteenth

century. Although Dorinda Outram points out that natural history was concerned with issues other than taxonomy in the enlightenment period (e.g. county and regional natural histories),[27] it is clear at Glasnevin, if not among the wider community of Irish naturalists, that plant classification was a driving imperative in the planting system of the early years of the garden.

Within a decade of planting the gardens, the issue of labels arose and would continue to be a concern over the coming decades. In 1810 the RDS instructed the Committee of Botany to immediately 'inquire into and report the state of the labels of the Botanic Gardens, and the cheapest and best mode of repairing the same'.[28] They met at the garden and promptly reported back that the labels were in:

> a very ruinous state, and [we] are of the opinion that new metal labels, bearing figures, having reference to printed catalogues of the plants, would be the cheapest and most durable.[29]

By 1812 the Committee of Botany was reporting that:

> metal labels, with numbers referring to a printed catalogue of the plants, would be more satisfactory, permanent, and cheaper than wooden labels; the price of the former being about 6d and of the latter 1s.6d each[30]

and that 'the labels in the garden are in a very ruinous and imperfect state'.[31] The fragility of wooden labels to the elements as well as their loss by being removed by birds during nest-making, a feature noted in the old botanical garden in central Cambridge, made it necessary for botanical establishments to procure and install the most robust types of markers.[32]

By early May 1813 the Committee of Botany had been instructed to assess the state of labels in the hothouses and to order as many cast-iron labels as deemed necessary for the garden.[33] Of the glasshouse labels, the Committee was of the opinion 'that wooden labels, painted of a white colour, with the names of plants legibly pencilled on them, are best calculated for that purpose' and reported that six thousand metal labels had been ordered for the outdoor collections.[34] The cost of labels in 1815 totalled £42 12*s*. 13½*d*. and was paid to the under suppliers, Messer's Clarke. A sum of £12 10*s*. 0*d*. was paid to the under gardener John White, for painting and lettering one thousand labels. Between 1814 and 1815, £417 was spent in total for labels and stages.[35] This represented an expenditure of thirteen per cent of the total budget for the garden.

While labels only needed periodic replacing, it is clear that unlabelled plants were considered unsatisfactory both as an educational tool for training apprentices and for the public. The arrangements themselves were also considered less meaningful if not clearly identified and named. Systems of classification could be relatively easily unhinged, and it has been claimed in the context of museums that one 'without labels is like an index torn out of a book; it may be amusing, but it teaches very little'.[36] Similarly, tree collections without labels might begin to resemble a woodland garden, a decorative plantation, or even a forest, but lacking scientific merit in the taxonomic sense of the term. In January 1820 more labels were required and it was recommended that they be painted white on a black background and that this would cost 1*d*. per label.[37] White, the under gardener, was subsequently paid £62 14*s*. 6*d*. for painting, lettering, numbering and varnishing 7257 labels at 2*d*. per label.[38]

In the first two decades of the nineteenth century the shape of the garden altered considerably. While in the early years large parts of the plot were unplanted, the arboretum and fruticetum were making good headway. This arboretum was developing

in advance of Loudon's famous treatise on the design and composition of arboreta.[39] The limey soil, however, limited the scope for planting *Ericas* and *Rhododendrons* and these were situated in special peat beds. The first major modification to the original garden was the excavation of a pond in what was meadow (Plate IX). Located in the north-western part of the garden and running roughly parallel with the River Tolka, the pond was carved in a serpentine shape and ran about 200 feet in length. It served to display both aquatic plants and marsh-loving species and was considered a valuable addition to the garden's arrangement. The other major change was the removal of the hay, vegetable and cattle gardens to the vacant south-western corner of the plot, as well as the removal of grasses, medicinal and plants used for dying. These plants were rearranged in rectangular, orderly beds with neat, straight paths separating them and this design resembled the earlier Renaissance gardens laid out in formal quadrangles.[40]

In the plots rendered vacant the tree, shrub and herbaceous sections at Glasnevin were further extended. According to Wade's 1818 prospectus of the garden, they continued to be arranged according to the system of Linnaeus, with metal markers affixed to each plant and these two divisions (arboretum/fruticetum and herbaceous divisions) 'are to be considered as the leading figures of the whole Botanical establishment – the scientific systematic arrangements, according to true Linnaean principles'.[41] In addition, however, on the ground immediately opposite the front of the Lecture Room and Library 'a very epitomised sketch of the celebrated Jussieu's Natural Families, or Natural System of Plants, is to be seen'.[42] While the Linnaean system of classification was popular, natural systems were also fashionable, particularly Antoine-Laurent de Jussieu's taxonomy, where order was seen to emerge from nature itself rather than being imposed by human agency. De Jussieu began developing a *méthode naturelle* in Paris from the 1770s onwards. He claimed to be advancing a classification practice that was based on the observation of natural *rapports* or affinities and these affinities could be more readily detected in botanical gardens where plants from diverse places were collected together. The spectrum of characteristics which overlapped between plants that were related were combined by nature itself, therefore, and not manufactured by botanists who artificially pressed plants into categories based on a few key characteristics, such as the sex organs used by Linnaeus. The sexual system could serve as a good introduction to natural history and had been the dominant one from the mid-eighteenth century, but the natural system was considered more advanced and superseded the sexual one in the nineteenth century. De Jussieu was just one among a group of botanists who developed natural systems. Yet, as Emma Spary has claimed, this emphasis on the 'naturalness' of the system depended on:

> The characters used for generating the classes … [being] drawn from parts judged a priori to be essential to the preservation of the species within the economy of nature – the seed, flower and fruit.[43]

And, ultimately, these decisions about natural plant relationships, being observable by the trained eye of the botanist, relied on a system of trust between plant classifiers such as De Jussieu and his scientific peers and followers. In Dublin we have the beginnings of the introduction of a second classification system into the garden during the first two decades of the nineteenth century.

During Underwood and Wade's first decades of tending the garden, the general principles of a botanical display were established. Nonetheless, by the 1820s both men were elderly and the condition of the garden declined. This was encapsulated in the controversy surrounding the death of the treasured Norfolk Island Pine. The tree had outgrown its original glasshouse and the RDS had contracted a new house to be built

around the tree. It was considered to be 'a beautiful and rare botanical specimen',[44] one of the largest and finest in Europe at the time. Amidst numerous building delays, the tree was exposed to the open elements in November 1820 when temperatures dropped to 22°F. and it subsequently died from this exposure. The Committee of Botany placed much of the blame on the shoulders of Underwood and from then until his retirement in 1834, maintaining order in the garden was a struggle.

Wade died in 1825 and Dr Samuel Litton replaced him. Litton was originally from London, but had completed a Bachelors' degree at Trinity College Dublin (1800), followed by a medical doctorate at the University of Edinburgh (1806). In 1815 he was appointed Librarian to the RDS before acquiring the Professorship of Botany in 1826. This corresponded with the ending of John Foster's influence over the botanic garden and Underwood's declining health. In his proposed initial set of lectures, Litton was to teach about plants suitable for agriculture, 'a natural history of trees, either actually reared or capable of being reared with advantage in Ireland',[45] and instruction on botany. In contrast to Wade, Litton focused on the science of plant structure and physiology and he left plant classification systems to the end of his lecture course.

In 1828 the Committee of Botany, in consultation with the Professor, was asked to report on the expediency and cost of transplanting some adult trees according to the Allantonian system with a view to making it the first example in Ireland, but nothing ever came of this proposal.[46] In the 1830 annual report of the Committee of Botany they sought more support from the RDS arguing that 'it [the garden] is already, perhaps, the most beautiful in Europe, with the rare advantage of a fine collection of forest trees'.[47] In the same year the RDS requested Litton to produce a report on the state of garden, especially with respect to the original objectives laid out when the garden was established. In the following spring, Litton presented his report to the Society.

In a confident voice Litton opened his overview by stating that the garden 'is much improved since I have had the honour of being appointed Professor of Botany'[48] and that visitors 'must have been gratified with the neatness and good order of the greatest part of it'.[49] The original divisions of the gardens, he pointed out, had been preserved with the addition of a Hortus Hibernicus and a division representing the De Jussieu arrangement. He was particularly complimentary about the Linnaean arrangement of the arboretum stating that Glasnevin 'is particularly rich in trees and shrubs, many of them extremely rare, and generally in good condition'.[50] He did, however, concur with an earlier recommendation by the Committee of Botany to extend the tree collection. He claimed:

> A great proportion of the trees in the systematic division are pressing upon each other, so that their natural form and habits are very imperfectly exhibited, and as they are disposed according to their botanical affinities, they are not always placed in the most favourable soil; it would add therefore much to the value of the arboretum, if duplicates of the most important of such trees were planted in suitable situations, as well as others which have become known to us since the formation of the garden.[51]

Of other sections of the garden Litton was more critical. He questioned the value of the cattle garden, complained about the condition of the hay garden and of the hothouses, and he proposed an extension of plants which would be useful to the florist. He also recommended that:

> many of the compartments of the systematic division should be enclosed with privet hedges, which, besides increasing the cheerfulness and variety of the scenery, would answer the more important ends of seclusion and shelter.[52]

This plan would add to both the practicality and the aesthetic appearance of the garden. The RDS acted on some of Litton's recommendations and, in particular, provided additional money for the repair of the glasshouses. Nonetheless, there was a general perception that the garden was in decline. It has been claimed that due to Underwood's ill-health he:

> allowed the apprentices to run wild, was rude to visiting members, let the water drain away from the lake in the arboretum and the aquatics perish, lopped branches from trees indiscriminately and in general stonewalled the efforts of the Committee of Botany.[53]

Eventually, the RDS took action: they pensioned him off and appointed Ninian Niven as head gardener in 1834. Like many gardeners in Ireland, Niven was also a native of Scotland. He had an impressive record of working as head gardener on many Scottish estates, of being a reasonable botanical painter, of receiving instruction from William Hooker and Stewart Murray, and, finally, of becoming head gardener at the Chief Secretary's Lodge in the Phoenix Park, Dublin, before taking up his post at Glasnevin.[54] Despite Niven's worthy credentials, his relationship with Professor Litton proved difficult and conflictual.

In early 1835 in a letter to the RDS outlining his progress and his plans for improving the garden, Niven raised the issue of labels and labelling. He pointed out that the herbaceous section had been completely rearranged, but he commented that:

> there are over 1100 labels without plants, those, with the openings left for the lately introduced plants, will require around 1500 specimens and varieties to [be added to the] collection.[55]

Of the arboretum, he noted that he was undertaking a careful examination of the trees and shrubs for pruning or removal. A number of contentious issues arose between Litton and Niven, but the primary one centred on plant classification. Niven proposed to replace the Linnaean arrangement of plants in the garden with De Jussieu's arrangement. Niven told Hooker in a letter that Glasnevin 'was destitute of any Natural Arrangement … [and that he would like] to exhibit a lineal arrangement of plants according to their natural orders'.[56]

In the 1835 meeting of the British Association in Dublin, Niven outlined his proposal and in November of that year he reported that:

> I am most anxious to proceed to the formation of a natural arrangement of plants, on the portion of ground partly prepared for that purpose; without which the garden remains comparatively vacant and incomplete.[57]

In this respect Niven was following the pattern of other gardens where natural systems were beginning to replace the sexual system. Litton opposed such a proposition declaring that the natural system might find itself replaced by yet another system in ten years time and that the garden would again need its plants rearranged. Litton pointed out that the gardens were there to promote the study of scientific botany and 'not a promenade for the mere refined amateur such as the garden of the Chief Secretary in the decoration of which Mr Niven has acquired deserved celebrity'.[58] Litton also objected to some of the ornamental beds that Niven had introduced into the garden, despite earlier recommending the expansion of some of the more decorative sections of the garden.

In spite of the conflict between the two men, Niven achieved a considerable amount in the four years he held the curatorship at Glasnevin. He succeeded in restocking depleted

Figure 2. '*Plan of Botanic Gardens, Glasnevin.*' (1838); from Ninian Niven, *A Visitor's Companion to the Botanic Gardens* (Dublin: William Curry, 1838)

collections and adding new plants to some areas of the garden. As the map of 1838 illustrates (Figure 2), the overall layout of the gardens did not radically alter from 1818, but there were some notable developments. The grass garden was converted into an experimental garden where economic crops useful to farmers were tested, e.g. potatoes. The cattle garden and Irish garden were removed and some of the trees in the arboretum were felled where overcrowding had occurred. He also made two important additions to the garden's tree collection. He introduced a fruit garden in the south field with the aim of showing the varieties which were most suitable for commercial growth in Ireland and to demonstrate to apprentices the process of developing an orchard – training, grafting and experimenting with fruit trees. The botanic garden already had some fruit trees in the arboretum but Niven's development of a new fruit section served to illustrate his horticultural skills and reflected his interest in this area. When Niven resigned, his fruit garden contained one hundred and three varieties of apples, sixty-three pears, thirty-nine plums and nineteen cherries.[59]

Niven also initiated the planting of a willow garden, located in the Mill field site adjacent to the river. The willows were cultivated to supply sets for those who wanted them. (The cultivation of willow for cane more generally was extensive along the banks of Irish rivers at this time.) In addition to his work in renovating and restoring the garden, Niven also produced a visitor's guide with a plan of the garden which was published 1938.[60] This was much appreciated by the members of the RDS and the public. It included, for instance, a graphic representation of the two systems of classification used in the garden, Linnaeus's (Figure 3) and De Jussieu's (Figure 4), thus offering the reader a visual tool for understanding botanical arrangements, educating the senses, and disciplining observation. Niven tendered his resignation in August 1838, primarily due to the poor relations between himself and the Professor of Botany, but he continued his career as a nurseryman in Dublin and as a respected landscape gardener.

Another Scotsman, David Moore, replaced Niven in November 1838. Moore had a vast array of experience before taking up the position in Glasnevin including the post of foreman at the Trinity College botanic garden, and botanist at the Irish Ordnance Survey in Belfast,[61] as well as an impressive list of referees, including William Hooker (Glasgow University) and Robert Graham (Edinburgh University). His first major task was to ensure that the garden survived the harsh winter of 1839. A January gale wreaked havoc across Ireland that winter and knocked down many of Glasnevin's trees. Moore thought that some of the damage actually improved the appearance of the garden, providing a more picturesque vista on the north side. Many of the trees in this section, he suggested, were of little scientific value and could be replaced by rarer species. By contrast, the exposure of Glasnevin village through the toppling of trees was regretted, as it exposed an unattractive view and laid the garden open to cold north-easterly winds.[62] As a consequence of the storm Moore raised many trees of significance, mainly poplars, oaks and pines and they survived the experience.

The development of the arboretum was one of the driving ambitions underpinning Moore's curatorship. Litton had written to the Council of the RDS in 1839 claiming that whilst the 'original beauty … neatness, order and tasteful decoration … [is not] surpassed by similar establishments' there were defects in the garden chiefly found in the systematic arrangements where plants were missing.[63] In 1842 Moore sought to revitalize the arboretum and he focused much of his attention on the western end. He suggested that it be extended in area by reducing the space occupied by the hardy herbaceous plants. He also suggested the removal of duplicates and unsightly or diseased specimens to obtain more space for rarer species. By 1843 he could report that new hardy pines

ABOVE AND OPPOSITE Figure 3. Carl Linnaeus's system of classification; from Ninian Niven, *A Visitor's Companion to the Botanic Gardens* (Dublin: William Curry, 1838)

from North America, Mexico and the Himalayas had been introduced to the garden, for instance the *Cedrus Deodara*. This had been achieved, he claimed, as 'New species have been added to most of the other genera through the arboretum, in places which were occupied by duplicates of the old species'.[64]

Although he continued Niven's work in rearranging plants to their natural order, it was impractical, he pointed out, to move fully established trees. Thus, the planting regime was partly regulated by the suitability of soil and aspect where new specimens were concerned, rather than just classification. The calpy limestone soil of the garden was

unsuitable for many coniferous American species and thus pits had to be dug and soil placed in them to grow certain species successfully. In his annual report of 1844 Moore could happily record that:

> In the Arboretum, many of the trees which have been recently added, native of the Mexican and Himalayan mountains, as well as other parts of the world, are now beginning to establish themselves, and prove their suitableness for the climate of Ireland.[65]

He felt confident that the *Pinus Montezuma* would turn out to be hardy enough. Not all plants were successful, however, and Moore reported that a small species of bamboo from Nepal struggled in the Irish weather and the canes were too small to be commercially

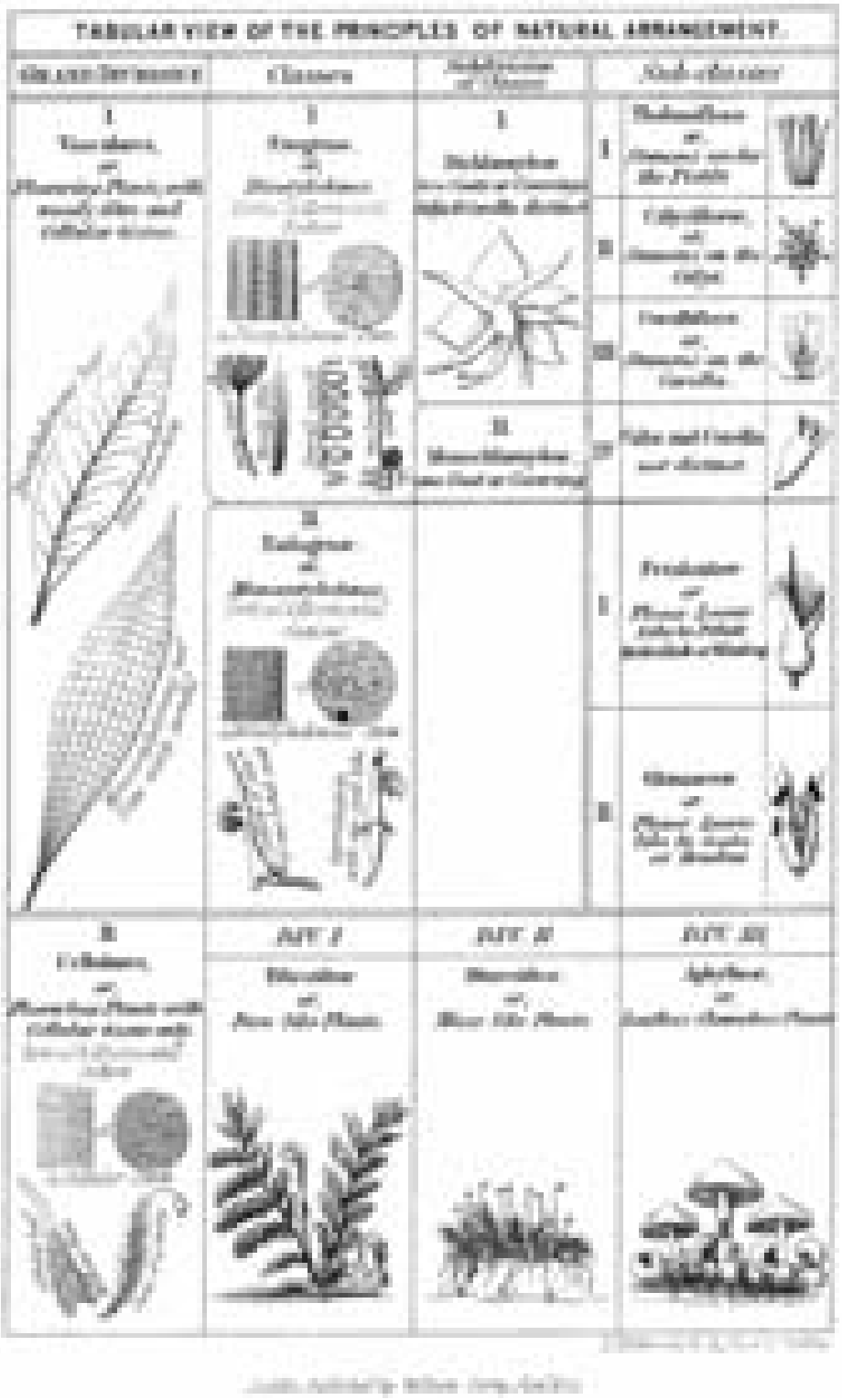

Figure 4. Antoine-Laurent de Jussieu's system of classification; from Ninian Niven, *A Visitor's Companion to the Botanic Gardens* (Dublin: William Curry, 1838)

viable.[66] Although there was also some tension between Moore and Professor Litton, they did manage to work together until Litton's death in 1847.

He was replaced by Dr William Harvey, a Limerick man of Quaker stock who had a keen interest in botany, who had served as Colonial Treasurer at the Cape of Good Hope, and who had received impressive recommendations from some of Europe's leading botanists (e.g. De Jussieu). In his first report to the RDS in 1848 Harvey made the following observations:

> The extent of the collection … is not great, but it is respectable … and I am sure that Mr Moore does all in his power to increase the scientific value of the Garden, by adding to it such new plants as he has the opportunity of procuring. … It is extremely difficult, if not impossible, without ample expenditure, to keep such extensive grounds in that nice order which a visitor, fresh from an English Garden, looks for; and your Curator is not to be blamed if his garden cannot compete in neatness with kindred establishments which have larger funds.[67]

While comparing Glasnevin to the standards of English landscape taste, Harvey was establishing a template of beauty to which the garden should aspire. And that aspiration was not in the cultivation of an indigenous, Irish aesthetic, but in imitating English fashions in garden design.[68] Harvey went on in this report to comment on the garden's status as a botanical establishment, and he provided a lengthy justification for altering the hardy collection from a Linnaean to a natural order classification system. He claimed that 'the student learns to embody a group that has a real existence in Nature, and to fix its image in his mind as a definite idea'.[69] This contrasted, he posited, with the sexual system which offered no insight into the real physiology of plants or their economic significance. This recommendation was accepted by the RDS and Moore set about transforming the hardy herbaceous collection.

In the following year's report Harvey recorded that the new arrangement was keeping 'pace with the advanced state of modern Botany' and that the design had been executed:

> with much taste and judgement, [Moore] availed himself of the shape of the ground to convert what was formerly an unsightly, and comparatively useless part of the Garden, into an ornamental [section]; whilst the scientific value of this part of the garden has been greatly increased.[70]

Clearly, the aesthetic and scientific were co-dependent in this analysis of the arrangement of the garden. Indeed, in Moore's own report he also praised the transformation from the sexual system to Dr Lindley's vegetable kingdom and he emphasized its beautifying effect. He commented that the natural system had been implemented through a series of:

> tastefully formed beds, on grass, where spaces have been reserved at suitable intervals for planting evergreen and other shrubs, to correspond, as nearly as possible, with the family of herbaceous plants. … This, it is hoped, will obviate much of that bare appearance, so generally characteristic of Botanic Gardens during the winter months, and, with the other alterations, give this department more the look of a well laid-out flower-garden, than the stiff, straight lines of plants, with their corresponding lines of tallies, so repulsive to good taste.[71]

The new arrangement clearly reflected his and Wade's twin desires to create a visually pleasing garden in line with contemporary tastes as well as creating an exemplar of the insights of botanical science. Moore further contributed to these aims by seeking to

popularize the names of orders for visitors by including their common names. He argued, for instance, that the Order Solanaceae would make much more sense to the public if accompanied by the common name Potato Family.

CONCLUSION

The firm foundations of the garden had been developed in the first half-century of the garden's existence and some of the major debates about the relationship between the objectives of science and the design of the garden space were negotiated. That the tree section of this garden formed an important part of this debate illustrates the significance of arboreta in the making of claims about scientific knowledge as well as their role in creating aesthetically pleasing spaces for professional and popular consumption.

Central to botanical arrangements were the twin concerns of taxonomic regulation and labelling. This reflected a broader enlightenment desire to create rational order and to expose visually the relationship between individual plants and a larger modulation of nature. Hence, these gardens were not designed to appeal exclusively to the aesthetic sensibilities prevailing at the time, although questions of elegance and beauty did intersect periodically with questions of scientific patterning. Nor were botanical gardens solely sites for developing horticultural and agricultural expertise. Fundamentally, they were spaces where the identification and labelling of plants were paramount, and at Glasnevin this issue of providing sturdy and clearly designed labels was one major preoccupation of the Professor of Botany and head gardener. Unlabelled trees and shrubs were not valued as scientific specimens and the disintegration of a systematic labelling scheme would risk transforming the garden from a centre of botanical science to a mere gardening space. Moreover, naming and labelling had to be accompanied by a systematic arrangement of plants in the garden around some agreed scientific classification system.

Whether 'artificial' or 'natural', the curators were at least agreed on the principle that botanical classification could best be understood through the exhibition of plants in their orders and classes. Consequently, the placement of plants was largely guided by the desire to reflect a classification system, and the arboretum at Glasnevin was no different to other botanical establishments in this respect. In addition, however, the tree section of the garden was also regarded as an ornamental space, screening undesirable views and creating vistas of its own. Individual specimens within the arboretum were valued for their rarity and for the visually pleasing effect they created. Crowding and replication of species were deemed undesirable. Ultimately, order and ornament could comfortably co-exist, as long as the scientific purpose of the garden and its trees was not obscured by a vision that would prioritize the recreational over the educational, the amusing over the serious, and the horticultural over the botanical.

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[65] David Moore, 'Annual Report of the RDS's botanic garden, Glansnevin', *Proceedings of the Royal Dublin Society*, 81 (1845), appx II, p. vi.

[66] David Moore, 'Annual Report of the RDS's botanic garden, Glansnevin', *Proceedings of the Royal Dublin Society*, 82 (1846), appx III, p. xxix.

[67] W. Harvey, 'Annual Report from the Professor of Botany 1848', *Proceedings of the Royal Dublin Society*, 85 (1849), appx IV, p. xxi.

[68] Elliott, *Victorian Gardens*.

[69] Ibid., p. xvi.

[70] W. Harvey, 'Annual Report from the Professor of Botany 1850', *Proceedings of the Royal Dublin Society*, 86 (1850), p. 74.

[71] David Moore, 'Report on the state of the RDS's Botanic Garden', *Proceedings of the Royal Dublin Society*, 86 (1850), appx IV, p. xxxvii.

BRENT ELLIOTT

FROM THE ARBORETUM TO THE WOODLAND GARDEN

This paper examines the arboretum from the point of view of design and planting style. The early nineteenth century saw a variety of approaches, whether scientific or aesthetic, to the organization of an arboretum. In the second half of the century attempts at layout for demonstrating plant taxonomy were largely abandoned, succeeded by planting for picturesque effect and by geographical distribution. Ideas about wild gardening and colour planning were introduced into arboretum planning, and the result was the development in the early twentieth century of the woodland garden, understood as a collection of exotic trees and shrubs planted so as to create the effect of exotic foreign scenery.

In the two centuries during which the word 'arboretum' has designated a recognizable garden-design type, it has always implied the use of exotic trees. Motives for exotic planting have been multiple and disparate. John Claudius Loudon had recommended exotic planting as one of the two major ways of making a garden into a work of art, the other being formal or geometric layout; and no doubt many owners of Lancelot 'Capability' Brown-style landscapes were happy to turn their unfashionable attempts at imitating nature into works of art by selectively adding exotic trees to the vista.[1] And, of course, once a fashion was launched, envy, snobbery and prestige could be relied on to promote it further, as this quotation from William Barron shows:

> what is so common as to see, even at the present day, *close to our mansions*, such common-place things as elms, ashes, sycamores, poplars, or any other rubbish that the nearest provincial nursery may happen to be over-stocked with.[2]

The collector's impulse was obviously a major determinant of the larger tree collections; economic interests (the potential uses of trees, and the ease of growing them in the British climate) influenced others; and an interest in taxonomy cannot be ruled out. But an aesthetic delight in the effects of particular trees has always managed to justify their use. The campaigns of the late twentieth century in favour of native-species planting had no parallel in the nineteenth; the idea that the exotic might not belong in a native landscape was not advanced by any significant authority until the closing years of that century, and then by architects rather than gardeners. Reginald Blomfield was probably the first important enthusiast for native-species planting, and his reasons were historical: native trees were what had been available in the centuries whose designs he wanted to emulate.[3] And for a couple of generations, even those who might have been sympathetic to the idea of the importance of native species were still swayed by aesthetic effect in favour of exotics. Wilfrid Fox, the creator of the Winkworth Arboretum in the interwar years, told this story of his experience of a critic of exotic planting:

> I took an artist friend to the top of the hill overlooking the valley, and it was clear from his expression that he saw it was good, and I explained my future plans. Then he turned

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> and rent me, asking if I really meant to defile this beautiful valley, this characteristic English landscape with trumpery little splashes of foreign trees and shrubs? Timidly, but I confess with malice aforethought, I asked him to point out the typical English trees he so much admired. He replied, 'Why, look at that lovely great stretch of mauve-pink running up the valley followed by a mass of wavy green'. I need hardly tell you that the mauve pink was a belt of Japanese Larch, and the green a plantation of Douglas Fir, both introduced into England about the middle of the last century. Which only goes to show that if one plants 'exotics' (sometimes a term of opprobrium) sufficiently boldly, they can, in a very short time, become part of our English scenery.[4]

METHODS OF ORGANIZING TREE COLLECTIONS

The theoretical literature on how arboretums were to be arranged is meagre at any period of history; the majority of publications on arboretums consists of tree lists, followed in quantity by perambulatory accounts of individual arboretums. More theoretical articles were produced during the second quarter of the nineteenth century than at any other time but, even so, there are not very many, and hardly any with illustrations. Only a few arboretums have had their plans published, a fact that has probably helped to create the twentieth-century myth of the 'plantsman's garden', created *ad hoc* without any foundation of design principles.

We may take, as both a pioneering and a naïve example, the Horticultural Society's arboretum at its garden at Chiswick, designed by the architect William Atkinson in the mid-1820s. Loudon, in his *Arboretum et Fruticetum Britannicum* (London, 1838), said that this 'collection, in their garden at Turnham Green, commenced in 1823, may be considered the first in England' – first in the sense of importance rather than of chronological priority, for Loudon gave a list of British arboretums that predated it (White Knights, Fonthill, Woburn Abbey the most important).[5] The Society's prospectus for the arboretum announced that:

> The arrangement of the Arboretum is not systematic, but all the species of each genus are placed as much as possible in the immediate vicinity of each other; thus affording an opportunity of convenient comparative examination.

The trees were grouped in clumps 'irregularly disposed on turf', mostly in oval or lozenge-shaped beds; some were miscellaneous in content, but most were devoted to one or two particular groups: willows, roses, horse chestnuts, *Daphne* and *Aucuba*, *Berberis*, hardy heaths, azaleas, etc. Loudon immediately criticized it on functional grounds, in terms which were almost never invoked by his successors as matters of relevance:

> almost all the arboretums in Europe have the trees planted along gravel walks that the botanist may examine them without damping his feet by moist earth or dewy grass; and the genera following each other either alphabetically, or in the order of some botanical system, that he may know where every genus is to be found. … In the arboretum of the Chiswick garden, the dug clumps are surrounded by grass, which, of course, can only be walked on in fine weather, and the genera are distributed through them at random.

His criticism of the design was at this point significantly less radical than it would soon become; he recommended that the 'Arboretum should be formed as a belt, combined with hardy herbaceous plants, and arranged in the natural manner'.[6] Within a few years, however, he was to launch a different attack, against the lack of a geometric focus, proposing instead that the arboretum should frame a circular garden.[7] When, at the end of the 1830s, Loudon was commissioned to draw up plans for the Derby Arboretum, he reversed this principle, making the arboretum the central feature, with

a surrounding walk demarcating it from the existing belt of trees around the periphery of the site.[8]

Alternative ways of organizing an arboretum, in which the purely ornamental was subordinated to the educational and scientific, were highlighted by Loudon in his *Gardener's Magazine* and in successive editions of his *Encyclopaedia of Gardening*. His greatest praise was reserved for the spiral arrangement of the arboretum at Loddiges nursery in Hackney, which compacted the greatest number of trees into the smallest space while keeping their order intelligible. Paxton adapted this arrangement for his arboretum at Chatsworth, where a slightly irregular path around the perimeter of the pleasure ground was planted on both sides with groups of trees arranged according to De Candolle's classification.[9] Loudon's serpentine path around the Derby Arboretum followed the same principle (contrasted with a system of straight paths down the centre of the Arboretum, for reasons both of convenience for the public and the provision of an axis of symmetry).

This sort of approach allowed taxonomic groups to be readily distinguished, but did not display the relationships between taxa. It is not certain that any actually planted arboretum was laid out as a higher-order taxonomic diagram, but Charles H. J. Smith, the author of *Parks and Pleasure Grounds* (London, 1852), recommended that an arboretum should be planted in a star-shaped pattern, so as to display the groupings of John Lindley's quinarian system of classification.[10]

Geographical distribution rather than taxonomy informed only one British arboretum at this period. The idea that vegetation types could be determined by their geography, and that there were intrinsic limits to the ability of exotic plants to succeed in the British climate, was only beginning to be understood in England at the time. Alexander von Humboldt had initiated the study of biogeography at the beginning of the century, but the relevant works were not translated into English until the end of the 1840s.[11] The idea had a glow of novelty about it when, in 1850, John Spencer planted a 6-acre conifer collection at Bowood, Wiltshire:

> The species indigenous to China are together, and adjoining those of Japan; then those of Tartary, Siberia, other parts of Russia, the Crimea, Persia, Himalaya, Norway, Western Europe, Spain, the Levant, Africa. In another division we find the Conifers of Hudson's Bay, Canada, the United States, N. W. Coast, California, Mexico, and Chili, &c.

Spencer professed to regard geographical distribution as 'by far the most important feature in studying [conifers'] general character', but no further arboretum was arranged on this principle until the end of the century.[12]

The idea that taxonomic considerations should govern the layout of an arboretum was questioned by other authorities, however. Robert Glendinning, who altered the Horticultural Society's arboretum at Chiswick in 1850, argued that 'To commence and continue an unbroken botanical representation in a park would be absurd'.[13] The ideas of grouping genera together rather than scattering them, and of some sort of formal or geometric arrangement for the display of trees, fitted in generally with the ethos demanded by Loudon, and could be put into practice without requiring the detailed presentation of a taxonomic system. At Madresfield Court, Worcestershire, in the 1860s, for example, William Cox planted avenues of fir and Atlantic cedar intersecting at right angles, forming a triangle with a further elm avenue.[14] Such arrangements could be adapted to any sort of garden, from the private estate to the municipal park and cemetery.[15] It is worth remarking here on the impressive heritage of cemetery arboretums in Britain, from Abney Park in Hackney, planted by George Loddiges *c.*1840, through the West Cemetery in Darlington,

planted and augmented by three successive superintendents from the 1870s to the 1940s, to a turn-of-the-century arboretum such as that at Ipswich New Cemetery.[16]

By mid-century few arboretums were as various as the pioneering example at Chiswick in terms of their selection of genera. Conifers were already enjoying an enormous vogue in the 1820s, before the expeditions of David Douglas, Carl Theodor Hartweg, John Jefferies and others expanded the range of new species introduced. The Douglas fir arrived in 1827, the deodar in 1831 (although there is some evidence for a previous introduction), the Monterey pine in 1833 (though most of that first introduction was killed off in the winter of 1837–38, so it had effectively to be re-introduced), the monkey puzzle by 1841 (though the Horticultural Society had distributed seed in 1827) and, finally, the wellingtonia in 1854.[17] By the 1840s the pinetum was recognized as a distinct subset of the arboretum, and in most people's eyes the most interesting subset.[18] By the 1860s, John Robson could lament:

> alas for the failure of human enterprises, the comprehensive 'arboretum' which promised to bring amongst us families hitherto unknown in cultivation, dwindled down into one of its branches, the pinetum.[19]

The opening to the public in 1851 of Elvaston Castle, Derbyshire, with its multiple avenues of conifers, each row taller than the one in front, had an immense impact on the gardening world. The pinetum, which was described by Glendinning as an example of the sublime in gardening, consisted of two symmetrical sections, each bisected by an identical quadruple avenue, with one section devoted to pines and the other to spruces and firs.[20] William Barron, the head gardener responsible for the planting, also excelled at topiary and grafting, altering the natural form of trees; it is possible that the example of Elvaston stimulated an increased interest in tree form as a source of aesthetic interest. (Loudon had already offered the idea of planting trees on little mounds, so that as they aged their root systems would be partly exposed, making them objects of greater botanical interest.)[21] At any rate, by the 1860s the former scientific aspirations of arboretum layout were seldom referred to any longer, and the characteristic arboretums of the next generation may be represented by Eastnor Castle, Herefordshire, where William Coleman replanted the pleasure grounds as an arboretum after the great storm of 1859 had levelled much of the original tree collection. The groupings at Eastnor were based primarily on the picturesque contrast of adjacent tree shapes: fastigiate, ball-shaped and layered (like cedars).[22] Earl Somers, the proprietor of Eastnor, was one of a group of dendrologically minded landowners who exchanged exotic trees among themselves; the others were Sir Philip Egerton at Oulton Park, Lord Delamere at Vale Royal, Robert Stayner Holford at Westonbirt, and Earl Ducie at Tortworth Court. Ducie's achievements in tree collecting were particularly admired, and when after the Second World War it was proposed to turn Tortworth into a prison, the Royal Horticultural Society (RHS) launched an unsuccessful campaign to prevent the exclusion of the public from this valuable collection.[23]

The great twentieth-century successor to these arboretums, which continued the tradition independently of the new influences to be described in the next section, was the Bedgebury Pinetum, Kent, designed by William Dallimore in 1925 as an outstation for Kew, where conifers did not flourish. There was an already existing conifer collection on site, dating from the 1850s and 1860s.[24] One of Dallimore's rules of planting was 'never plant more than two trees in a straight line', and yet the main vistas in Bedgebury are characterized by avenues – but avenues:

> graded, coming down to dwarf conifers and other plants like Gaultheria shallon on the margins, then groups of the handsome chaps behind and, tucked away inside, partly for shelter, partly to prevent them being eyesores, the conifers for which the climate and soil of Bedgebury are not truly suited.

Fastigiate trees were planted along the valleys, rather than on the hillsides, so as to avoid interruptions to the skyline, and trees were frequently grouped in quincunxes, to be reduced to groups of three when they needed to be thinned. The composition resulting from these principles was highly praised in the mid-twentieth century.[25]

THE WILD GARDEN AND LANDSCAPE COLOUR

The arboretum as a collection of exotic trees underwent other modifications in layout in the second half of the century as two trends, which arose in the wider world of the domestic garden, exerted their influence. The first of these was the wild garden. The term is associated particularly with William Robinson, who wrote the first book on the subject (1870), though it was grounded in the previous quarter-century's experiments by a variety of gardeners.[26] Its major emphasis was, as Robinson later specified, on the naturalisation in English gardens of plants from 'climates as cold as or colder than ours'.[27] Japanese knotweed and giant hogweed were among the plants to benefit from Robinson's advocacy. Already long established by the 1870s was the naturalization of *Rhododendron ponticum*. On its first introduction, it had been restricted to 'American gardens' or peat beds, on the assumption that, like American rhododendrons, it required swampy and peaty soil. In 1841, the *Gardeners' Chronicle* published correspondence from various gardeners pointing out that they had succeeded in growing *Rh. ponticum* from seed in ordinary English soil, whereupon Philip Frost of Dropmore pointed out that he had long known this, and that 'It is very easy to fill woods with them, by sowing the seed broadcast'.[28] By the 1850s it was being used extensively for the planting of game coverts, and was thus launched on its increasingly successful takeover of the British countryside.

Robinson's influence was still strong in the mid-twentieth century; Kenneth Johnson, writing in the 1960s of the use of exotic conifers at Bedgebury, said:

> There can be no doubt that if a plant flourishes and reproduces it must be in the right place and consequently it will look right. Such ecological considerations provide a key to planting design.

This use of the word 'ecological' would, a generation later, seem incomprehensible, but for many writers and designers of the post-war period, any plants that naturalized easily in the British countryside were deemed to form part of the ecology; Brenda Colvin justified *Rh. ponticum* on precisely these grounds.[29] But there was more to the wild garden than naturalization; it also had implications for the grouping of plants:

> There has been some misunderstanding as to the term 'Wild Garden.' It is applied essentially to the placing of perfectly hardy exotic plants under conditions where they will thrive without further care. It has nothing to do with the old idea of the 'Wilderness.' It does not mean the picturesque garden, for a garden may be highly picturesque, and yet in every part the result of ceaseless care. What it does mean is best explained by the winter Aconite flowering under a grove of naked trees in February; by the Snowflake, tall and numerous in meadows by the Thames side; by the blue Lupine dyeing an islet with its purple in a Scotch river; and by the blue Apennine Anemone staining an English wood before the coming of our blue bells. Multiply these instances a thousandfold, given

> by many types of plants, from countries colder than ours, and one may get a just idea of the 'Wild Garden'.[30]

Wild gardens in Robinson's sense were incorporated into several existing arboretums, replacing the effect of trees arising from green lawns with that of trees arising from flowery meads. As early as 1862, the newly established firm of Barr & Sugden was advertising 'Paxtonian packets' of mixed annual seed, for the purpose of scattering in woodlands. At Madresfield Court, for example, Owen Thomas reported in the Edwardian period that:

> The trees have been planted wide apart (excepting in the avenues); thus they have ample scope for the full development of their form and beauty. It is fortunate for another reason, for it has enabled the present owner to convert the larger spaces between the trees into a rare garden of hardy ornamental flowering and foliage trees and shrubs, and of bulbous plants. … The practice of grouping in masses of one colour is a great feature throughout these gardens, no confused mixing of colours being tolerated.[31]

The wild garden also brought with it a new emphasis on colour, evident in both the above quotations. Even Robinson, who had begun his career attacking the use of colour schemes in the flower garden, came (probably under the influence of Gertrude Jekyll) to advocate the massing of colours nearly everywhere else, in the rock garden, and in the wider landscape.[32] But the man most responsible for creating interest in the idea of the colour grouping of trees and shrubs was William Paul, the Director of the Royal Nurseries at Waltham Cross. In 1864 he published a series of articles in the *Gardeners' Chronicle* extolling the selection of trees for coloured foliage and bark. There was little immediate response, but when in 1870 he repeated his advice in a lecture to the RHS, the gardeners in the audience applauded his ideas:

> Mr. D. T. Fish complained that the ruin of our landscapes had been the mixed system of planting, sufficient attention not having been paid to distinctness of colour. He did not advocate the introduction of so much green into our gardens.[33]

Within a few years Alexander McKenzie, the designer of Finsbury and Southwark Parks, was recommending the massing of rhododendrons as flowering shrubs: 'There is practically no limit to our choice in the selection of colours', so they 'should be planted with a liberal hand wherever there is plenty of room for shrubs'.[34] William Paul was to go on to propose that Epping Forest be replanted with scarlet oaks, conifers, birches, and *Rhododendron ponticum* to increase its range of colours.[35]

The first garden to be written up for its massing of trees and shrubs by colour was Waddesdon Manor, Buckinghamshire, whose grounds were laid out and planted in the late 1870s and early 1880s:

> The older and main drives and walks are of great width, and are planted on either side with great masses of shrubs, disposed in groups of a sort, the form of the groups being triangular, the base and the point coming alternately to the front, and as they are now touching each other, and generally each plant in a group is fully developed, they will never look better than at present. The species and varieties are – Spiraea Thunbergii, Laurustinus …, Golden Yew, a capital variety, backed up with Viburnum opulus; Thuia sinensis aurea, Acer Negundo variegata, many kinds of Berberis, as dulcis, stenophylla, Hookeri, atropurpurea; purple Corylus, Copper Beech in several tints of foliage, mahonia aquifolia. Lilacs in profusion, and of the best coloured varieties, grow and flower beautifully, the Persian being much used for groups. Double Thorns of several shades of colour, amongst them Paul's scarlet, standing pre-eminent for vivid colour. … The effect is heightened by an undergrowth of closely planted Gynerium.

> Pyrus, Cerasus, Laburnum, Rhododendrons, Azaleas, New Zealand Veronicas, Kalmias, and others far too numerous to mention, form those great masses before spoken of as lining the shrubberies on all the main walks. A plant seldom met with in great clumps is Hippophae rhamnoides, but which is at Waddesdon planted in quantity; one great bank of it will in winter exhibit great masses of its heavily-berried branches of orange-scarlet. … The bank had an edging of Spanish Furze.[36]

The first phase of colour planning in the wider landscape had dissipated by the First World War to be succeeded by the graded colour sequences popularized by Jekyll using flowering shrubs. But certain aspects continued into the twentieth century: a renewed interest in autumn colour (much discussed in the 1840s but quiescent during most of the nineteenth century), and, in the interwar years, an enthusiasm for massed collections of spring-flowering trees and shrubs, such as cherries and magnolias. This interest had begun before the end of the nineteenth century, as part of a reaction against the perceived gloominess of High Victorian conifer planting. During the interwar years it erupted in the planting of massed collections of magnolias and cherries (Collingwood Ingram's introductions of Japanese cultivars arousing great excitement). The classic summary of the planting selection, Michael Haworth-Booth's *Flowering Shrub Garden*, first appeared in 1938 and, with successive editions, carried the style on into the 1960s.[37] Two significant examples are Tittenhurst, Surrey, where the original conifer collection was supplemented between the wars with a cherry avenue and a magnolia garden, promoted by *Country Life*; and the short-lived cherry garden at Wisley, planted by Francis Hanger in a pattern reminiscent of Elvaston's arrangement of conifers: two transverse avenues (one of *Prunus yedoensis* and the other of the cultivar 'Tai-haku'), the resulting quadrants filled with an assortment of cultivars.[38]

THE WOODLAND GARDEN

The cumulative impact of the wild garden and of colour planning on the arboretum was to integrate the tree collection with the shrub and herbaceous gardens, in unified combinations whose colours were a key determinant of their placing. An important precedent was set at Bearwood, near Wokingham, Berkshire, where John Tegg designed a shrub garden where a geometric parterre would normally have been set, close up to the house. Robinson's magazine *The Garden* described his work enthusiastically in 1879:

> a noteworthy feature at Bearwood is the absence of all elaborate geometric designs, which are too often met with, defacing extensive lawns, and materially detracting from the imposing grandeur of a noble mansion.

Tegg's shrubs, 'planted in bold groups, with irregular natural-like outlines', failed to impress a later generation, for when a formal garden was created at Bearwood in the Edwardian period, *Country Life* did not recognize that there had once been a garden there.[39]

Work began on Lord Armstrong's garden at Cragside, Northumberland, in the 1860s, and by 1880 vast acres of the estate had been afforested with conifers, and the pleasure ground turned into what may be regarded as the pioneering example of the woodland garden:

> The open grounds around the house and several chosen parts of the glen are planted with specimen Firs and carpeted with Rhododendrons, Kalmias, Ledums, Ericas, Menziesias, and other dwarf shrubs, interspersed with sheets of natural Heath in bloom.[40]

In the wake of Cragside, increasingly more gardens began to create what could now be distinguished as woodland gardens: no longer simply tree collections, but re-creations of exotic forest scenery, real or imagined.

Any list of the most famous woodland gardens of the first half of the twentieth century would include Leonardslee, Sussex; Wakehurst Place, Sussex; Minterne, Dorset; Bodnant, Gwynedd; Sheffield Park, Sussex; and The High Beeches, Sussex, all commenced before the First World War but becoming famous in the interwar years. The earliest was probably Leonardslee, which was bought by Edmund Loder in 1887, and was already mature as a woodland garden by 1906.[41] The woodland garden at Wakehurst Place was created by G. W. E. Loder, later Lord Wakehurst, a future President of the RHS, who had bought the estate in 1903.[42] Bodnant was originally an H. E. Milner garden of the 1870s with an established conifer collection, but its character changed with the construction of the great terraces, between 1905 and 1914, years which also saw the beginnings of rhododendron planting.[43] Minterne was essentially an eighteenth-century landscape garden before 1906, when Lord Digby, having had the house remodelled, began to modify it.[44] Sir Giles Loder, with his head gardener A. W. Mansfield, began making the woodland garden at The High Beeches in the same year.[45] Arthur Soames bought the Sheffield Park estate in 1909; it had a long history as a landscape garden, with work by 'Capability' Brown and possibly by Humphry Repton, and cascades by James Pulham, and a significant addition of conifers in the Victorian period.[46]

This group of gardens shares various common features. Leonardslee, Sheffield Park and Bodnant already had extensive plantings of conifers, within which the woodland gardens were developed. Some of the gardens benefited from their owners' shares in subsidising the expeditions of early twentieth-century plant collectors: Lord Digby, in particular, subsidised E. H. Wilson, George Forrest, Joseph Rock and Frank Kingdon-Ward, keeping meticulous records of the plants received from these expeditions.

In every case, rhododendrons played a major role in the planting. Before 1905, only *Rhododendron ponticum* had been planted at Bodnant, on the grounds, later disproven, that Chinese species would not grow there. But Bodnant, and also Leonardslee, both became important centres of rhododendron breeding, with two generations of both the Aberconway family and their head gardeners the Puddles becoming famous for hybridization at Bodnant, and the 'Loderi' crosses originating at Leonardslee. J. G. Millais, the author of important works on rhododendrons and magnolias, advised on the creation of the woodland garden at The High Beeches, and a collection of rhododendrons introduced by George Forrest became one of its major features.[47] At Minterne, Lord Digby began by using the flower colours of rhododendrons to determine their positions, but in the post-war years he became increasingly interested in their foliage colours: 'This aspect of rhododendron planting, now firmly started at Minterne', he predicted, would 'lead to great possibilities in the grouping of rhododendrons in the future'.[48] At Leonardslee, a magnolia collection formed an upper storey, with a rhododendron and camellia wood below, and wild garden underplanting on a large scale. Arthur Hellyer, praising Sheffield Park in the 1950s, said:

> Lovers of colour will be dazzled by the brilliance of rhododendrons, which are not arranged haphazardly, like a patchwork quilt, but are planted in great beds … for skilfully conceived mass effect.[49]

What the pelargonium was for Victorian bedding schemes, the rhododendron was for the woodland garden, whether planted in beds, in a segregated walk (as at Wakehurst Place), or scattered throughout the woods. More than any other tree or shrub the

rhododendron characterized the early twentieth-century woodland garden because of its variety of forms, sizes, foliage types and, above all, flower colours.[50] Not to mention, of course, its role as the most coveted category of plant sought by collectors in China and the Himalayas. E. H. Wilson, Forrest, Kingdon-Ward, and Ludlow and Sherriff all introduced new rhododendron species in significant numbers; Forrest and Kingdon-Ward published volumes of field notes on rhododendrons, separately from the miscellaneous fieldnotes from their expeditions. Two separate societies – the Rhododendron Society (1913) and the Rhododendron Association (1927) – were founded to promote the cause of the genus, with a shared membership during their period of coexistence.[51] Many of their members were engaged in building collections of rhododendrons, contributing to the syndicates that financed the plant hunters. J. C. Williams of Caerhays, Stephenson Clarke of Borde Hill, and John Barr Stevenson of Tower Court, Ascot, were among the garden owners who were most active in the interwar years in introducing, describing and distributing rhododendron species.

The literature on woodland gardens repeatedly emphasizes their replication of foreign scenery. Here is Lanning Roper on Knox Finlay's garden, Keillour:

> Here huge forest trees provide the ideal shelter for great-leaved rhododendrons, Asiatic magnolias. … Here are conditions and scenery almost identical to the … slopes of China from which so many rhododendrons have come.[52]

Most such comments came from the pens of writers who, like Roper, had never seen the native environments they invoked, but had read the descriptions of Himalayan scenery in the travel narratives of Joseph Hooker, Reginald Farrer and Kingdon-Ward. However, George Sherriff, the last of the great Himalayan collectors, aimed at the same effect in his garden at Ascreavie.[53]

This interest in exotic scenery, coupled with the increasing familiarity of the concept of geographical distribution – by this time one of the mainstays of Darwinian theory – meant that many woodland gardens followed the (probably now forgotten) example of Bowood, and developed areas devoted to the plants of particular regions. Wakehurst Place had separate collections of American and Chinese trees and shrubs (along with a pinetum, a rhododendron walk, a heath garden and the Slips, an area devoted to pieris and magnolias). At Sheffield Park, Arthur Soames added a palm avenue, a conifer walk, and a Kalmia walk, but also including areas grouped geographically: a Himalaya walk and an Auckland walk.

During the interwar years this group of gardens was among the most famous and influential in Britain. The same emphases continued in the first major woodland garden to be begun after the First World War: Exbury, which Lionel de Rothschild began in 1921 as a rhododendron-breeding outstation, the family's main garden being at Gunnersbury Park. As with Leonardslee and Bodnant, there was already a collection of conifers on site.[54] But many of the later examples failed to attain the prestige of their predecessors. The Lea Rhododendron Garden near Matlock, Derbyshire, for instance, was begun in 1935 by John Marsden-Smedley in a quarry across the road from his house; but, although popular with garden visitors, it was not celebrated the way the gardens listed above had been. Partly this may be due to a simple form of market saturation – there were already so many famous woodland gardens – but partly also it might have been due to a problem of scale. An interest in dwarf rhododendrons was kick-started by George Forrest's introductions and promoted by E. H. M. Cox, to become a major theme in post-war planting; it has often been felt that these plants were out of scale with the forest trees that formed their backdrop, and more suited to the rock garden. The Lea

Rhododendron Garden was not the only woodland garden that yielded increasing space to rock gardening within its confines; a partial precedent here had been set by Exbury.[55]

A new style of woodland garden, in which glades and vistas became the major means of organizing the composition, and in which colour massing was downplayed, was promoted by Eric Savill during the 1930s, with the creation of the Savill Garden in Windsor Great Park. Savill once remarked that it would be better for a gardener to be colour-blind than to get too involved with colour schemes. Nonetheless, colour massing provided the dominant image of Savill's next project, the Valley Garden, begun after the Second World War. The nucleus of the Valley Garden was the collection of rhododendrons built up at Tower Court, Ascot, by John Barr Stevenson, who had planted them in their series (as these were understood at the time, before the Cullen and Chamberlain revision of *Rhododendron*) as a taxonomic exercise, without regard to form or colour. These were transplanted to the new garden. But among Stevenson's plants was a collection of Kurume azaleas, and these formed the garden's centrepiece: the Kurume Punch Bowl, a scooped out depression filled with a blaze of azaleas in a rough ring shape. Hope Findlay had arrived at Windsor Great Park in 1943, as Savill's assistant, and he, rather than Savill, may have been the creator of this scheme, in which colour planning once again became a dominant force.[56]

The same years saw the development of Battleston Hill, a portion of the RHS's garden at Wisley. The land was acquired in the 1930s, and envisaged as a site for rhododendron trials, but any development was interrupted by the war, and work finally began in the late 1940s, under the new Curator Francis Hanger, who had formerly been head gardener at Exbury. With donations of rhododendrons and azaleas from Exbury, Bodnant and Tower Court, Hanger was able to create a garden with a variety of conditions ranging from dense shade to open sunny glade, so the azaleas could be grouped according to degrees of shade tolerance. Hanger preferred to have 'one blaze of riotous colour' rather than a graded colour scheme. The resulting garden was greatly popular in the third quarter of the century, but when Battleston Hill was largely flattened in the 1987 storm many people were relieved that the colour display, now considered garish, had gone.[57]

Much of the literature on woodland gardens deals not with matters of aesthetics, but with inventories of the collections. Partly for this reason a suspicion was to grow later in the twentieth century that woodland gardens were not creations of art, but collections only, whose merit was to be found purely in the species they comprised. The term 'plantsman's garden' by the 1980s became a term of opprobrium, implying that the owners of the gardens stuck trees in wherever they could find a place, without reference to an overall design. In the years after the 1987 storm, when English Heritage for the first time offered grants for the repair and replanting of historic gardens, the Historic Parks and Gardens Advisory Committee spent hours arguing over whether 'plantsmen's gardens' qualified for grant aid, or whether their importance was purely horticultural rather than artistic. So a good counter-example was found in Trewithen, Cornwall, the garden of George Johnstone, the author of *Asiatic Magnolias in Cultivation* (London, 1955). Here, eighteenth-century planting had created a dense beech wood perforated by avenues; parts of the wood were felled under government order during the First World War. Johnstone used the glades thus created for growing exotic trees and shrubs, especially rhododendrons and magnolias; the result was an impressive woodland garden which left the outlines of an early eighteenth-century garden almost completely intact.[58]

CONCLUSION

The arboretum and the woodland garden are two distinct types of landscape, and arboretums continued to be designed during and after the heyday of the woodland garden. Maurice Mason signalled the independence of the concepts in his two Norfolk gardens: he used the term 'arboretum' for his tree collection at Talbot Manor, begun in the 1930s, whose major collections were maples, *Robinias*, willows and oaks; after the Second World War he acquired the nearby Larch Wood site, an area of existing woods, which he partially cleared to make paths and glades, planted with rhododendrons, and called a woodland garden.[59] Nonetheless, the woodland garden developed from the nineteenth-century arboretum by a series of simple steps. Once the early attempts at a layout that reflected accepted taxonomy had been abandoned in favour of picturesque composition, the addition of wild-garden underplanting and of planning for colour effects resulted in a characteristic garden type. In the first half of the twentieth century, and into the 1960s, the woodland garden was, as far as the horticultural press was concerned, the most esteemed and influential of gardening fashions.

When Miles Hadfield published his *Gardening in Britain* (London, 1960), he thought it was too early to make judgements about the great gardens of the twentieth century, but considered that Westonbirt, Bodnant, Sheffield Park and Hidcote would certainly be among the gardens that future generations would consider representative. A quarter-century later, when Jane Brown published her *The English Garden in Our Time* (Woodbridge, 1986), the list of the century's great gardens was significantly different. Only Hidcote featured on both lists; to this, Brown added Rodmarton, Sissinghurst and possibly Shute.[60] The formal and architectural garden had once again triumphed, and the woodland garden, at mid-century regarded as the twentieth century's great contribution to gardening, had fallen from favour.

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SIMON NAYLOR

PROVINCIAL AUTHORITIES AND BOTANICAL PROVINCES: ELIZABETH WARREN'S *HORTUS SICCUS OF THE INDIGENOUS PLANTS OF CORNWALL*

This paper traces the rise and demise of a regional botanical mapping project: Elizabeth Warren and the Royal Cornwall Horticultural Society's Hortus Siccus of the Indigenous Plants of Cornwall, *compiled in the latter half of the 1830s. It looks at the Society's Indigenous Plants Exhibitions, Warren's curatorship of the resulting dried herbarium and the wider regional botanical culture in which the project was developed. It also examines the way in which Warren developed and promoted the collection and its collectors, most notably through her connections with William Hooker at the Royal Botanic Garden, Kew. It then considers the effects of the natural historian H. C. Watson's criticism of Warren's botanical survey and John Ralfs's response to it – his manuscript 'The Flora of West Cornwall' (1878–84). The paper concludes by reflecting on the changing relations between regional studies and larger national endeavours to survey Britain's plant life.*

NATURE'S GEOGRAPHIES

The nineteenth century was arguably the era of the county flora and fauna.[1] Hewitt Cottrell Watson's, admittedly partial, survey of English regional floras in his *Topographical Botany* (London, 1873)[2] demonstrates a clear rise in popularity for regional, county and local floras in England from the 1830s to the 1880s. David Allen has argued that the British county, in a similar manner to the French *département*, provided a well-defined area of study, 'conducive to reasonably thorough botanical investigation within a reasonable number of years'.[3] He has also noted the prohibitive costs of publishing until the 1830s, when the steam-powered printing press significantly reduced the costs of bringing out a book. The increase in numbers of regional floras identified in Watson's text go some way to justifying Allen's claim.

Cornwall, England's most south-westerly county, certainly witnessed a growth in the number of texts that dealt with its natural history – for instance, John Pike Jones's *A Botanical Tour Through Various Parts of the Counties of Devon and Cornwall* (1820), John Paris's *A Guide to Mount's Bay and the Land's End* (1824), the Revd Charles Johns's *A Week at the Lizard* (1848), John Daniell's *A Geography of Cornwall* (1854), and John T. Blight's *A Week at the Land's End* (1861). Although the Great Western Railway did not extend down to Penzance until 1867, the county was becoming increasingly popular with the Romantic tourist and the convalescent and these books catered for a new demand for information on the region – Johns's *A Week at the Lizard*, for instance, was laid out in seven chapters, each detailing a visitor's itinerary over the course of a day. Cornwall was similar to other regions of Britain that were becoming middle-class tourist destinations, such as the Lake and Peak Districts and North Wales,[4] in that its appeal resided in its

Department of Geography, University of Exeter, Cornwall Campus, Penryn, Cornwall TR10 9EZ, UK

remoteness from major towns, its rugged landscapes and topographical features, as well as its unique histories and natures.

It was not just an external interest in Cornwall that drove the production of books on Cornwall's nature in the first half of the nineteenth century; local people too began to write about their county's natural history. These endeavours were encouraged and supported by the general growth in natural history societies in the nineteenth century.[5] Despite its geographical isolation, Cornwall was at the forefront of this movement. In 1814 the Royal Geological Society of Cornwall was established in Penzance, it being only the second such society in Britain after the Geological Society of London. This was closely followed by the Royal Institution of Cornwall (RIC), founded in 1818. Based in Truro, it was originally named the Cornwall Philosophical Institution and its present title was only adopted when the society came under royal sponsorship in 1821. Like many nineteenth-century societies the RIC actually found its origins in the literary and philosophical societies of the late eighteenth century.

In 1833 two more scientific societies were formed in Cornwall – Falmouth's Royal Cornwall Polytechnic Society and Truro's Royal Cornwall Horticultural Society. The Polytechnic Society was formed by the Foxes, a wealthy Quaker family who made their money in shipping. Like the RIC in Truro, the Polytechnic Society promoted a wide range of activities and researches and was particularly concerned with the improvement of the working classes. This was also the case with the Royal Cornwall Horticultural Society (RCHS). Established as the Cornwall Horticultural Society, and housed in rooms at the RIC, the society was 'for promoting the study and practice of Botany and Horticulture, and for improving the condition of the poor by the distribution of prizes to Cottagers'.[6] At the centre of its work was a series of competitive exhibitions, held in different towns throughout the year, where local people could exhibit their crops.[7]

In their early years these societies were all run by the local landed gentry, filled by the middle classes and aimed at the improvement of the working classes (although the middle classes gradually took over the positions of power later in the nineteenth century). The first four presidents of the RIC were the Lord Exmouth, Sir Charles Lemon, Lord St Levan and the Earl of Mount Edgcumbe, between them leading the Institution from 1818 to 1883. Lemon was also the second President of the Polytechnic Society, after Lord de Dunstanville, and of the Horticultural Society, before Lord Boscawen took over the presidency of that society. Born in 1784, Lemon had been educated at Harrow and then the University of Cambridge, and inherited his baronetcy in 1824 upon the death of his father, Sir William Lemon. He gained much of his wealth through mining. He was MP for Penryn, then after the 1832 Reform Act for Cornwall and for Cornwall West. He was also a Fellow of the Royal Society of London, a founder and the second President of the Statistical Society of London (now Royal Statistical Society), and the Provincial Grand Master of Freemasons of Cornwall. Lemon was indicative of a small group of elite gentlemen in Cornwall who governed the county, made their money through industry, harboured an interest in science, and believed in the improvement of the working classes through education and rational recreation.[8]

All the societies mentioned above, along with the Penzance Natural History and Antiquarian Society (established 1839; hereafter PNHAS), made significant contributions to the natural history of the county.[9] The RIC financed the publication of a three-volume fauna of Cornwall,[10] whilst it, the Polytechnic Society and the PNHAS published regular articles by local members on natural history topics; the Polytechnic Society improved understandings of local weather through its meteorological observatory;[11] and the Geological Society, the PNHAS and the RIC all ran museums. The RCHS contributed

to this endeavour through its attempt to compile a complete flora of Cornwall. In 1833 the Society included a section for collections of dried Cornish plants at their regular horticultural exhibitions. A register was to be kept of all those exhibited, so that they might make up a comprehensive *Hortus Siccus of the Indigenous Plants of Cornwall*. Miss Elizabeth Warren was charged with the task of compiling this work.

This paper traces the rise and demise of Warren's *Hortus Siccus*. It begins with an outline of the work of the RCHS and the genesis of the county herbarium, before discussing reasons for the lack of a botanical garden. It then provides a sketch of Warren and her botanical interests and goes on to examine the way in which she developed and promoted the collection and its collectors. It then considers the effects of H. C. Watson's criticism of Warren's botanical survey and John Ralf's response to it – his manuscript 'The Flora of West Cornwall' (1878–84). The paper concludes by reflecting on the reasons for Warren's early botanical successes and ultimate failure.

THE RCHS AND ITS INDIGENOUS PLANTS EXHIBITIONS

At the RCHS's October exhibition of 1833 the society introduced a new category, with prizes being awarded for the 'largest and best collection of Cornish dried plants'.[12] (For an example of the Society's exhibition display cards, see Figure 1.) The plants entered at these exhibitions formed the basis of the Society's *Hortus Siccus* of the indigenous plants of the county. An annual 'Indigenous Report' was included as part of the Annual Report of the Society and, from 1834, lists of indigenous plants wanted for the *Hortus Siccus* were also printed.

To help in this endeavour the Society began to set money aside to fund the establishment of a library of botanical books and cabinets for specimens. Some documented the flora of regions, others particular plant groups, or gave general introductions to the field. As well

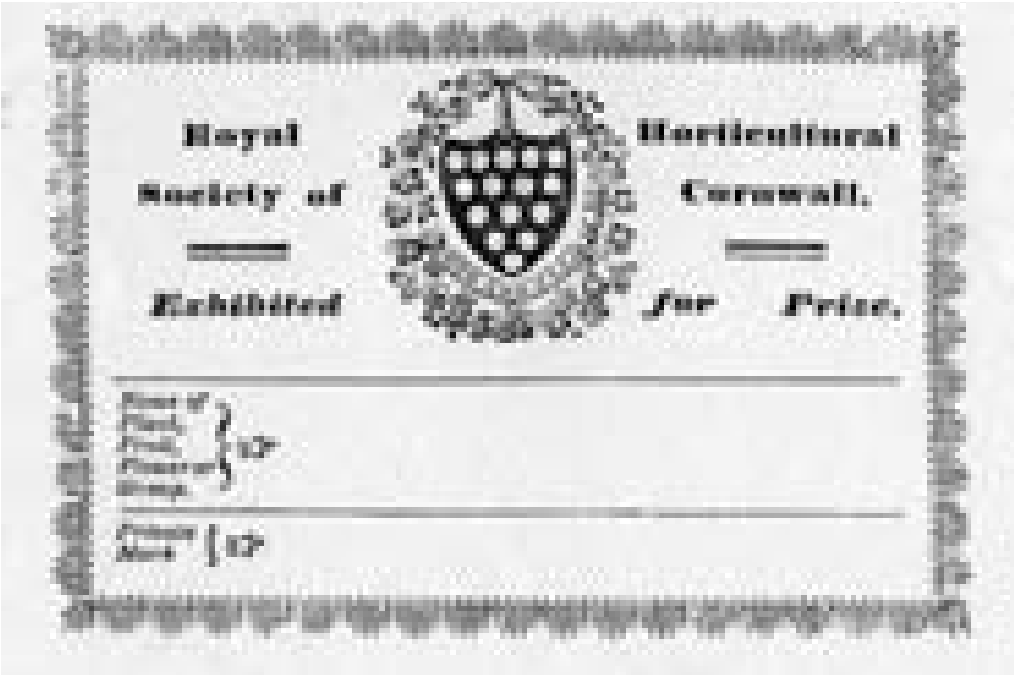

Figure 1. Example of a Royal Horticultural Society of Cornwall exhibition card

as assisting the judges of the exhibitions of the indigenous plants, the books were meant to open a wider world of botanical scholarship to the broad membership of the Society. In particular, it was hoped that the library would excite 'a larger interest in investigating the Flora of this County which, although peculiarly rich, is still almost unknown'.[13]

Despite these wishes, the establishment of a small library was viewed as something of a substitute for the most ideal botanical teaching space of all – a botanical garden.[14] In fact, the RCHS did try to establish a botanical and horticultural garden in 1840, and even secured land for it, but the attempt was reported to be unsuccessful and was not pursued.[15] Such an apparent lack of concern about the establishment of a botanical garden or arboretum, especially when set against the fervour that surrounded the establishment of scientific museums, might be explained by the numerous private gardens that were being planted in Cornwall at around that time. D. Lysons and S. Lysons noted in 1814, for instance, that:

> most of the proprietors of lands in this county are directing their attention to planting, so that in thirty or forty years, Cornwall will present extensive wood-land scenery, both useful and ornamented.[16]

Their prediction was certainly accurate, with a large number of gardens being established in the sheltered valleys of the Cornish south coast. For many landowners, this was as much a scientific endeavour as it was an aesthetic one, as the mild climate and ready access to exotic species of plants through the Falmouth Packet Service facilitated experiments in acclimatization. This was so much the case that by the end of the century the noted Cornish botanist Hamilton Davy was able to state that:

> As the Englishman has shown adaptability for almost every country under the sun, so the climate of Cornwall has successfully wooed into obedience floral varieties from the temperate to the equatorial zone. Indeed, it is no exaggeration to say that every known land has been laid under contribution by our gentry in their praiseworthy labour of love.[17]

Many of those involved in the organization of the Cornish scientific societies participated in this acclimatization project, the Fox and Lemon families being particularly notable. Charles Lemon was a keen plant collector. He had been a sponsor of Joseph Hooker's Himalayan expedition and had offered awards to Packet commanders who brought the largest numbers of new plants back to Britain with them. He planted seeds from Hooker at his Carclew estate and experimented with tree planting. At the third exhibition of the Horticultural Society in 1832, Lemon claimed that 'our climate is particularly favourable for making experiments in the comparative hardiness of exotic plants' and that 'Should any one be desirous of visiting his gardens, he would be happy to point out to them those plants which appeared to him to be acclimatised'.[18]

The Fox family – so central to the success of the Polytechnic Society – also developed gardens at Penjerrick, Trebah and Glendurgan, all of which were close to Falmouth. At Penjerrick (bought by the Fox family in the early nineteenth century as a summer residence) Robert Were Fox carried out experiments on the acclimatization of plants. He was credited with naturalizing over three hundred species, many brought to him by clients of the family shipping agency.[19] At Trebah, Charles Fox planted shelter screens and then developed the steep wooded ravine below the house. From the topmost windows of the new mansion Fox, along with the help of a telescope and megaphone, directed an army of gardeners in a planting operation across the 25 acres. Many of the plants were seedlings, but Fox had his gardeners scrambling and struggling up and down the

steep slopes of the ravine, carrying wooden scaffolding towers, supposed to represent a particular plant in its maturity.[20]

Like the Foxes and Charles Lemon, many other landowners also developed their gardens. As Pring notes, 'in design terms, as the Victorian age progressed, anything and everything was tried', including the use of glass houses, the building of vast rockeries, as well as numerous themed American, Japanese, and Italian gardens.[21] With all this planting, landscaping and experimenting being carried out in Cornwall, it is, therefore, perhaps of no surprise that Cornwall's various scientific societies were relatively unconcerned about the establishment of a botanical garden or arboretum of their own.

ELIZABETH WARREN (1786–1864)

Whilst Cornwall's notable families turned their gardens into microcosms of exotic distant lands, its Horticultural Society laboured to gather its own county's plants together in one textual repository. The task of administering this *Hortus Siccus* was given to Elizabeth Warren. Warren was born in Truro on 28 April 1786. She never married and resided for most of her life at Flushing, a village on the Penryn River facing the large port of Falmouth, popular as a residence for Packet Service Captains and famous for its regular dinners, balls and parties. She was familiar with many of the local landowners already mentioned, particularly the Fox and Lemon families. Warren did not work, and it was reported by Isabella Gifford (the author of Warren's memorial upon her death) that 'the labours of collecting and arranging her collections gave her always sufficient occupation when at home'.[22] Warren died at Kea, near Truro, at the residence of her sister, Mrs Temple on 5 May 1864.[23]

Warren divided the time she devoted to botany to field-collecting, the preparation and labelling of specimens, involvement with local scientific societies, and correspondence and botanical exchanges, most notably with Sir William Hooker, Director of Kew Gardens, to whom she corresponded regarding the Cornish flora and her other botanical projects. Warren was an enthusiastic fieldworker, conducting forays into the Cornish countryside around her home and beyond and she continued to botanize into at least her sixties. Warren portrayed her fieldwork as a gentle and appropriately accompanied activity, conducted amidst a bucolic landscape – what S. Hunt in his analysis of mid-Victorian 'seaweed literature' refers to as a 'genteel topography'.[24]

Warren botanized across a range of habitats, although her long-standing interest in cryptogamic plants and, in particular, in marine algae (or seaweeds) meant that the shoreline was her preferred site of activity. Warren published several articles on this group of plants in local scientific journals, although this was almost the full extent of her publishing endeavours.[25] She was an adept cataloguer and preserver of botanical specimens and her efforts gained her a number of prizes when her specimens were displayed at the regular exhibitions of the Polytechnic Society and the Horticultural Society.

By 1836 Warren was one of the judges appointed by the RCHS to inspect the specimens entered in the indigenous plants exhibition. Although she was enthusiastic about the project, she was less optimistic about the value of the exhibitions in the generation of new additions to the Cornish flora. She wrote to William Hooker on several occasions expressing her low expectations of 'seeing any novelty exhibited in the Indigenous Department'.[26] Despite her frustration, Warren took the position seriously. For instance, she pushed William Tweedy, the RCHS Secretary, to get the stations of entries for prizes 'particularized and authenticated' by 'our best authorities'.[27] She was particularly concerned about over-enthusiastic collectors submitting specimens that were not indigenous at all, but were either accidentally sown or deliberately planted in a

domestic garden, or for farming purposes. The county's warm climate – what she termed its 'aptitude … to acclimation' – made the propagation of relatively exotic species a very real possibility, requiring 'no little scrutiny to keep the Flora of Cornwall within its own true limits'.[28] The numerous schemes to introduce exotic species by local landed families – many of which were close acquaintances of Warren – obviously posed a particular threat, although Warren was too discrete to name them explicitly. There was a threat to knowledge too of course – indeed, we might even conceive of the *Hortus Siccus* as an attempt to bring Cornish botanists (as much as Cornish flora) back to their 'own true limits' and away from the seductions of more exotic specimens.

THE *HORTUS SICCUS OF THE INDIGENOUS PLANTS OF CORNWALL*

A fairly small group of botanists were responsible for the majority of the specimens that eventually went on to make up the *Hortus Siccus*. The *Hortus Siccus* itself – which exists as three large volumes of dried and pressed specimens, held in the archives of the Royal Institution of Cornwall[29] – includes mention of twenty-three contributors alongside the specimens themselves (Figure 2). Warren certainly made effective use of Cornwall's dispersed group of botanical collectors to further the project entrusted to her by the RCHS, but that did not mean those collectors were left unrewarded. Indeed, there were several benefits for those who provided specimens to the RCHS's *Hortus Siccus*. Most obviously, supplying the RCHS with indigenous plants was a potential source of reward for collectors through the Society's programme of exhibitions and awards. However, financial motivations for collecting botanical specimens should not be over-emphasized. Few of the botanists involved in the *Hortus Siccus* attempted to make their living through the revenues raised by collections. In the main the reward open to the collector was

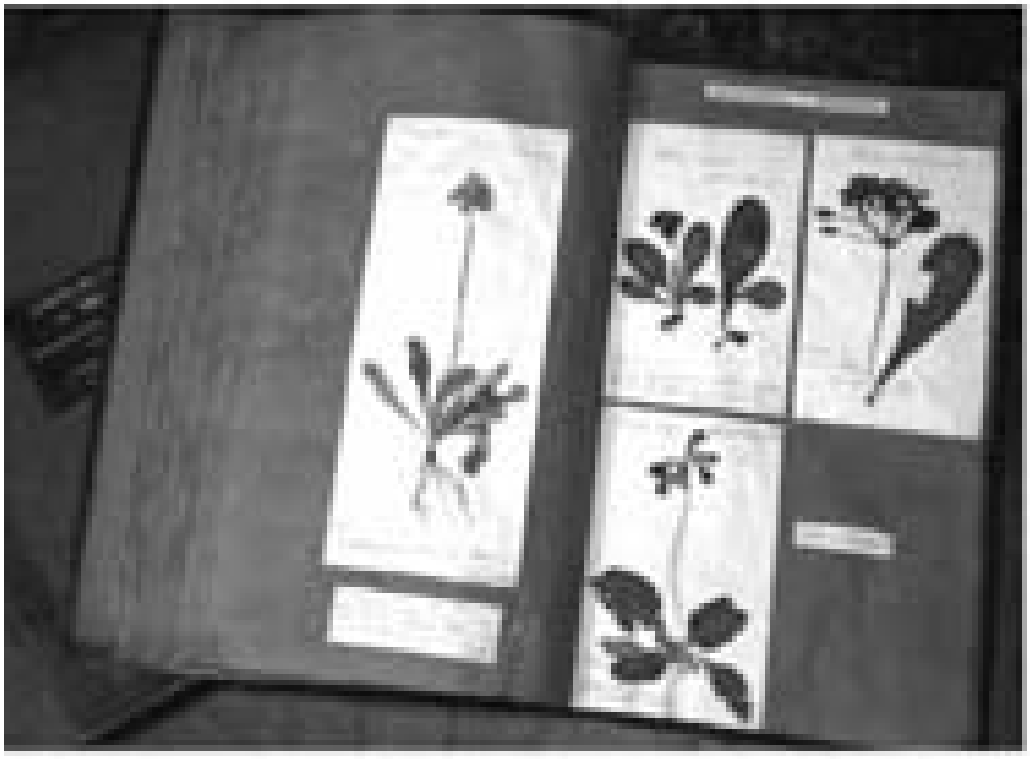

Figure 2. The *Hortus Siccus of the Indigenous Plants of Cornwall*

in terms of prestige rather than financial remuneration; indeed, as Secord has noted, the exchange of specimens for money questioned the scientific disinterestedness of those involved in the exchange.[30]

The real benefit of donating specimens to Warren for these collectors was an improved reputation as a good collector and identifier, a careful preparer and labeller, a reliable and respectable correspondent, and, above all, an expert in local botany. Warren, for her part, did all she could for her fieldworkers' reputations, both within and beyond Cornwall, and, in many ways, this was her own form of remuneration for the services rendered to her by them. She went to great pains to highlight to Hooker the various merits of scientific proficiency, mechanical dexterity and personal presentation possessed by her army of collectors.

As Warren helped local artisan botanists, so did she in turn look to Hooker for intellectual support and encouragement. Warren began corresponding with Hooker in December 1834, when she wrote to him complimenting him on his *The British Flora*.[31] As well as regular letters, she supplied him with botanical specimens from Cornwall, procured either by herself or by those collecting for the *Hortus Siccus*. She also used her geographical position close to the port of Falmouth and her family connections in the Royal Navy, as well as the RCHS's links to Cornishmen overseas, to provide Hooker with plants from around the world. She secured for him specimens from as far afield as India, North America, Hong Kong and the Falkland Islands.[32]

Warren's steady supply of botanical specimens from Cornwall, as well as overseas, certainly earned Warren more then just Hooker's approval, thanks and advice. In reply to one package from Hooker, Warren replied saying:

> I beg to return you my best thanks, with Commodore St Livans for your readily naming the Falkland Island specimens, and Lichens, enclosed in my last letter, but most particularly mine for your handsome present of the new edition of your Flora, recently received. It is indeed an admirable work, most judiciously arranged, and the plates excll'ng.[33]

The esteem with which Hooker held Warren's botanical labours was amply demonstrated by this gift of a book. Local botanists were no less effusive in their enthusiasm for Warren's work on the Cornish flora. As superintendent of the *Hortus Siccus*, she received constant praise from other members of the RCHS. For instance, in the report of the Annual General Meeting of the Society on 4 March 1834, 'great progress' in the collection of the indigenous plants of the county was noted:

> which under the superintendence of a Lady (Miss Warren, whose love for, and knowledge of, the science of Botany, render her so competent), is now in progress of arrangement.[34]

In 1837 the Society chose to award her one of their Silver Medals:

> for a trifling acknowledgement of the important services she has rendered to the Society, and of her zealous endeavours to promote the cultivation of Indigenous Botany[35]

whilst, in 1844, they made her an Honorary Member, 'as a mark of the high esteem in which they held that lady'.[36] Perhaps the greatest praise though – for a student of marine algae at least – came from the German botanist Robert Caspary, who named *Schizosiphon warreniae* (now called *Rivularia biasolettiana*) in her honour in 1850.

HEWETT C. WATSON AND THE DEMISE OF THE *HORTUS SICCUS*

Although Warren's work was well received during her lifetime, later interpretations of her work were less supportive. This section considers the criticisms of Hewett Cottrell Watson and John Gilbert Baker as well as those of the Cornwall-based botanist John Ralfs.

Watson's life-long interest was the geographical distribution of flowering plants in Britain and he made quick use of several prominent national botanical societies to further his desire to gain a comprehensive and accurate record of Britain's plants and their distribution. In particular, Watson became heavily involved in the running of the Botanical Society of London. The London Botanical Society, established in 1836, assumed the role of a botanical exchange and information repository and Watson acted as its 'Distributor'. Allen notes that Watson:

> bullied the Society into bringing out a standard checklist, known as the *London Catalogue of British Plants*, so that all who sent in plants could be made to observe the same common system of nomenclature.[37]

Watson alone collated this *Catalogue*, which he employed as a way of forming a nationwide census of British plants.[38] In 1838 Watson published provincial distribution maps for thirty-nine different species of flowering plants, the maps based on the subdivision of Britain into eighteen broad areas, or 'Provinces'. With the inclusion of more data Watson switched to smaller units – to 'Counties' and 'Vice-Counties'. The attribution of plants with geographical coordinates would, Watson argued, enable the botanist to generate statistics of plants' geographical relationships, and even to address the question of what constituted a species.[39]

Whilst Watson used his *Cybele Britannica* to lay out the philosophical case for his biogeographical project, his *Topographical Botany* was addressed to those who made his endeavour possible – the myriad of local botanists who sent in collections of specimens to the Botanical Society of London.[40] For each of the 'more generally known and accepted species' Watson indicated the vice-counties in which they had been recorded, who had recorded them, and the manner in which they had been recorded.[41]

Watson wanted all botanists to follow his recording techniques and geographical schema and was largely intolerant of records that did not do so – indeed, he used his *Topographical Botany* to highlight those local botanists who failed in this regard. Warren was one of these. In reference to her *Hortus Siccus*, Watson stated that:

> as the list of names related to the whole county, not especially to either vice-county, it was found practically almost useless for the objects of the present work. There are names entered in the list, which are those of plants very unlikely to be found in the county, such as *Primula farinosa* and *Polygonum maritimum*; so that either misnomers or mis-locations would appear to be found in the collection.[42]

This rebuke came despite the fact that the RCHS had been supplying the Botanical Society of London with duplicate specimens since 1843 and at the suggestion of Warren herself.

JOHN RALFS'S *THE FLORA OF WEST CORNWALL*

John Ralfs, one of the most prominent of Cornwall's natural historians in the latter half of the century, agreed with Watson's assessment of Warren's *Hortus Siccus*. Ralfs moved to Cornwall in 1837 due to his poor health and resided in Penzance until his death in 1890.[43] He was a botanist of national reputation, producing several books and

a number of articles on the subject.[44] He was also President of the Penzance Natural History and Antiquarian Society between 1884 and 1885. Ralfs's retiring address to the Society recounted the history of botany in Cornwall, where he emphasized the extensive but rather fragmentary and unsystematic nature of botanical enquiry in the county.[45] He also highlighted an external perception – expressed by John Gilbert Baker, Keeper of the herbarium at Kew and a close friend of Watson[46] – that the Cornish flora was 'most imperfectly registered'[47] and he was anxious that the Cornish flora should be produced in such a way that it could be incorporated into more general attempts to compile a national flora.

In his address to the Penzance Society, Ralfs acknowledged the various criticisms Watson had made of botanical endeavours in the county, reluctantly echoing Watson's claim that Warren's *Hortus Siccus* contained 'misnomers or mislocations'.[48] Ralfs also recognized the 'scattered' nature of botanical inquiry. He took it upon himself to provide a complete flora of the vice-county of West Cornwall that would fulfil the requirements of Watson's more general schema, and so too 'render it impossible in future for any Botanist truthfully to stigmatise West Cornwall as "one of those counties of Britain the distribution of plants within which is most imperfectly registered"'[49] – again, a direct reference to Baker. The result was Ralfs's nine-volume manuscript 'The Flora of West Cornwall', written between 1878 and 1884 and deposited in the Penzance Public Library.

Ralfs was keen to establish his own regional project as synonymous with Watson's; indeed, to even enact Watson's grand distributional investigations within the confines of one vice-county. He took on Watson's advice on the classification of plants in a region, under the heads 'natives', 'denizens' and 'colonists',[50] whilst in his own guidance to readers as to the most suitable botanical handbooks, Ralfs chose to highlight the fact that he followed the nomenclature and arrangement of the seventh edition of the *London Catalogue of British Plants* 'because it is almost universally accepted as the standard authority of the British Flora'.[51]

CONCLUSIONS

There are a number of plausible reasons for the demise of Elizabeth Warren's *Hortus Siccus*. Anne Shteir mobilizes Warren's case in her consideration of women's place in botany from 1760 to 1860 and uses it, along with a large number of other instances, to argue that women were progressively excluded from an increasingly professionalizing botanical science.[52] Shteir's study provides a powerful reading of the history of botany and one that certainly explains Warren's reluctance to publish and her general unwillingness to take part in many of the more public aspects of natural history in her county and beyond. However, other factors came into play in the demise of Warren's county botanical recording project.

Much of Warren's success in compiling the *Hortus Siccus* came from her marshalling of a network of correspondents, collectors and supporters. These ranged from the many local naturalists in Cornwall, who willingly supplied Warren with specimens, to notable landowners, who supported societies such as the RCHS and who paid for the postage of Warren's letters and parcels from Cornwall to London, and to the likes of William Hooker, who provided Warren with real social capital in her own regional context. As Strathern reminds us in her work on gift economies, 'those who dominate are those who determine the connections and disconnections created by the circulation of objects'.[53] Warren's authority was founded in the network she had built and so it was imperative that she constantly demonstrate the reliability, trustworthiness and probity of her collectors.

Watson and Baker changed all this. In their own attempt to produce a botany of Britain they effectively argued that the truth of their work should rest on method rather than reputation. It was the manner in which botanical information was collected and recorded that was of prime significance to them; that they were personally unable to vouch for their collectors' character was of much less importance. This emphasis was intimately connected to a new valuation of place in the natural sciences. Natural history enquiry in the mid-nineteenth century was witness to a number of attempts to rethink the geographies of natural history enquiry; Watson's vice-county system was one of only a number of systems (albeit a very influential one) by which nature was literally placed, with others from the period based on river catchments and soil types for instance. Warren's own collection was certainly geographical in scope, but it failed to fit into broader schemas because it *did not travel* – Warren's *Hortus Siccus* was too firmly embedded in its own locality.[54] Whilst Ralfs's flora was written with the local botanist in mind, its observance of Watson's requirements meant that it could nonetheless move easily beyond the confines of its study area; with Ralfs saying that: 'Mr Watson's limitation of West Cornwall being the one universally accepted in botanical works, I do not consider that I ought to ignore it'.[55]

In conclusion, what distinguished Ralfs's study from Warren's was not so much its emphasis on place as its ability to be situated within a wider geographical context. It was this that ultimately led to the demise of Warren's regional mapping project and, it might be argued, to the increasing marginalization of similar studies in local natural history in the second half of the nineteenth century.

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DAVID WHITEHEAD

VETERANS IN THE ARBORETUM: PLANTING EXOTICS AT HOLME LACY, HEREFORDSHIRE, IN THE LATE NINETEENTH CENTURY

In nineteenth-century Herefordshire the antidote to an arboretum or pinetum and the formal display of recently introduced trees was to follow well-established picturesque canons and plant exotics, either as individuals or in groups, within existing parkland. When Sir Edwyn Stanhope Scudamore inherited the Holme Lacy estate in 1820, he found a deer park already celebrated for its ancient trees. Infected by the mid-Victorian rage for exotics, Sir Edwyn and, more especially, his son, Sir Henry, transformed the park by planting many new introductions without compromising its venerable aspect. The results can still be admired today – just!

One of the enduring features of the English countryside is the presence on the skyline, often in the midst of unspectacular farmland, of a cluster of sentinel evergreens. Almost without exception, they mark the site of an aspirational landscape, created in the late 19th century, where there will be the inevitable Scots pines, European larch, Douglas fir, a Cedar of Lebanon and a Wellingtonia – still heading skywards, even after a lightening strike. Romantic sensibility, easily expressed on the ground with picturesque planting, encouraged the owners of every 'seat', and even prosperous farmers, to plant dense evergreen shrubberies, with elevation provided by exotic conifers.

The many publications of John Claudius Loudon, and his imitators, provided detailed advice on how to achieve a 'gardenesque' effect with grace and discrimination. On a larger scale, the great landowner, with extensive policies and perhaps a park, would similarly be encouraged, even inspired, to instruct his gardener or forester to plant more adventurously, especially in areas reasonably accessible to the house, where gravel paths could provide all-weather access for men, as well as women. The enthusiasm for planting exotic conifers was given impetus by Loudon's *Arboretum et Fruticetum Britannicum* (London, 1838) and its abridged, but more popular version, *An Encyclopaedia of Trees and Shrubs* (London, 1842–83).[1] There were also specialist books such as George Gordon's *The Pinetum* (London, 1858–80) with its mouth-watering catalogues, bound into the later editions.[2] This led to the creation of full-scale arboretums such as those at Bowood, Eastnor and Biddulph Grange.[3]

The systematic planting of an arboretum, according to geography or the Linnean system, called for the rejection of picturesque principles, and thus was rarely adopted by landowners who were increasingly interested in the antiquity of their grounds, which, although probably extensively planted in the eighteenth century, were developing a venerable aspect, to which the *nouveau riche* planter could not hope to aspire. Good taste demanded that hobby or commercial planting should take place discreetly, enhancing

60 Hafod Road, Hereford HR1 1SQ, UK

specific locations without giving the impression of a makeover. In Herefordshire, the birthplace of the Picturesque, landowners were imbued with the teachings of Uvedale Price and Richard Payne Knight. 'Intricacy and variety' accorded well with the local landscape of 'combes' and bosky 'tumps' that gave special flavour to the Welsh Border.[4] The 'aspiring larch' planted in serried ranks would always be out of place here and equally the display of 'the capricious planter' who:

> By quaint variety to cause surprise;
> Collects of various trees a motly host,
> Natives of every clime and every coat;
> Which, placed in chequer'd squares, alternate grow,
> And forms and colours unconnected show:

On the other hand Knight also recommended:

> … the conic fir, or round-topp'd pine,
> In blended groups may happily combine;
> Or near projecting, with their sable dye
> Contrast the distance, and confine the eye.[5]

Knight's neighbour, Price, also felt that new plantations of firs and larches, set out between established woods created disconnection, appearing like 'so many awkward pieces of patch-work'.[6] On the other hand, 'a collection of hardy exotics may also be considered as a very valuable part of the improver's pallet, and may suggest many new and harmonious combinations of colours'. Thus:

> less familiar foliage among our natural trees, has the same pleasing effect, as when a beautiful and amiable foreigner has acquired our language and manners so as to converse with the freedom of a native, yet retains enough of original accent and character, to give a peculiar grace and zest to all her words and action.

SOME HEREFORDSHIRE PARKS PLANTED WITH EVERGREENS

'With art clandestine, and conceal'd design' the discriminating planter could handle his augmented pallet and there were few estates in the county untouched by the nineteenth-century interest in exotics. Even Moccas Park, that holy-grail of ancient trees, was planted in the mid-nineteenth century with western red cedar (*Thuja plicata*), coastal redwood (*Sequoia sempervirens*), giant fir (*Abies grandis*), deodar cedar (*Cedrus deodara*) and at least two Wellingtonias (*Sequoiadendron giganteum*), which survived until the late twentieth century.[7] In the park at Whitfield, to the south-west of Hereford, in the midst of Treville Forest, celebrated for its champion sessile oaks and small-leaved limes, the Clives espoused the new planting of the mid-nineteenth century with considerable enthusiasm. E. B. Clive (1791–1847) planted cedars and Scots pines throughout the landscape, taking very seriously the recommendations of Price. Whilst to the west of the house he could not resist establishing a pinetum, which still contains about twenty redwoods (*Sequoia sempervirens*). When members of the local naturalists' society visited the estate on one of their regular 'fungus forays' in late September 1890, they spent most of their time admiring the silver fir (*Abies alba*), said to be 100 feet high, several fine specimens of Monterey cypress (*Cupressus macrocarpa*), a pencil cedar (*Juniperus virginiana*), and finally a 'deciduous tree of the yew family, in Japan called a Ginkgo' (*Ginkgo biloba*), which had apparently been planted in *c.*1775 – about twenty years after its introduction.[8]

The interest shown by the Woolhope Naturalists Field Club (founded in 1851 with a membership of minor gentry and professionals) in exotic trees at Whitfield and elsewhere is a significant barometer of the wider enthusiasm for new introductions, which were changing forever the landscape of Britain.[9] The Club was rarely at a loss for the current scientific name and appears to have regularly consulted Loudon's *Arboretum*. Their curiosity was never exhausted, and on the day following their visit to Whitfield they progressed a few miles to the north-east to explore the grounds of Rotherwas belonging to Mrs De la Barre Bodenham (Figure 1). The fungus finds were disappointing but the head gardener, Mr McCabe, kept them fully engaged pointing out the 'most rare and best grown trees'. Among the rarities was a tulip tree (*Liriodendron tulipifera*), its bright green foliage towering over the adjoining *Abies* and *Picea*, a scarlet oak (*Quercus coccinea*) and an Italian cypress – 'probably the oldest in the country' – an eastern spruce (*Abies orientalis*?), hemlock spruce (*Tsuga canadensis*), Douglas fir (*Pseudotsuga menziesii*) and many other exciting new trees. Interestingly, members of the Club were often able to offer advice and additional information, suggesting more than a passing knowledge of Mrs Bodenham's collection. They commented upon a large weeping ash (*Fraxinus pendula*), an interesting variety of thorn (*Crataegus crus galli*) and were delighted to be taken to the site of the 'famous old elm' (*Ulmus campestris*), which they knew had been mentioned in Loudon's *Arboretum*, although it had been blown down in 1839.[10] Mr McCabe produced a copy of a woodcut 'kindly sent to him by Mr. Robinson of *The Garden*' – presumably William Robinson.

Standing beside the Wye at Rotherwas, two miles below Hereford, the members of this quaint provincial society were suddenly revealed as participants, indeed, contributors, in the burgeoning world of Victorian natural science – a world in which the modern distinction between amateur and professional just did not count. They thanked Mr McCabe for his hospitality and returned to Hereford by carriage for their Annual Dinner

Figure 1. The extensive shrubberies at Rotherwas seen from the park *c.*1900 with walnut and sweet chestnut in the foreground. Courtesy: Hereford Record Office, Bustin Collection

at the Green Dragon Hotel, where one of their honorary members, Dr M. C. Cooke, author of *Illustrations of British Fungi* (London, 1881), warned them of the conceits of contemporary natural science – 'fads and faddists'.[11] Without any sign of self-awareness his address was received with great enthusiasm.[12]

THE EARLY HISTORY OF THE PARK AT HOLME LACY

The delights of Rotherwas were swept away by Lloyd George in 1916–18 when the estate was purchased by the government for the construction of a munitions factory. However, a few miles further down the Wye, another, larger estate, Holme Lacy, survives with its great house intact, its late seventeenth-century gardens restored (with an Edwardian polish) and its 288-acre park, albeit damaged by neglect, commercial forestry and the plough, sufficiently intact to trace in some detail how a landscape park, much admired by Uvedale Price, could absorb the Victorian enthusiasm for exotics without quite becoming an arboretum (Figure 2). A path, we have seen, followed by many landowners in Herefordshire and presumably, elsewhere in England.

Before the Norman Conquest, Holme Lacy was officially in the Welsh sub-kingdom of Ergyng or Archenfield and its church probably in the diocese of Llandaff. Thus the western half of the extensive parish was regarded as a 'welshry' – an area for administrative purposes outside the feudal law of the Anglo-Norman kingdom. The landscape was well wooded in the Middle Ages, providing building timber, fuel and pannage for the tenants of the Bishop of Hereford, both in Holme Lacy and across the Wye in the city of Hereford

Figure 2. Aerial view of Holme Lacy *c.*1950 with, in the left-hand corner, the house and formal gardens with the Wilderness Pools beyond. The parkland sloping towards the house has already been encroached upon by arable farming. Brick Kiln Wood – still deciduous – can be seen to the right. Courtesy: The Principal, Holme Lacy College of Agriculture

and Hampton Bishop. Very quickly after the Conquest the estate was sub-infeudated into a series of knightly holdings – hence its association with the de Lacy family.[13]

Within the 'welshry' in the remote western area of the 3000-acre parish, a branch of the Scudamore family was found settled in the fifteenth century. The first named member of the family at Holme Lacy was Philip who lived at Gannah – 'a place of game' – where in the following century a red deer park appears.[14] John Scudamore, a gentleman usher of Henry VIII and local receiver of the Court of Augmentations, made the fortune of the family. He added considerably to the Holme Lacy estate by purchasing monastic property and in 1536 securing a long lease on the two surviving church manors – Bury Court and Wood Court. A new mansion was built in 1546 on one of the church manors and in 1577 Saxton marks the house surrounded by its park.[15] However, the early seventeenth-century household accounts suggest that the deer park remained at Gannah, whilst the new house was provided with extensive enclosed gardens in the medieval manner. Around this was a working landscape of sheep pasture, woods, orchards and pools. Only slowly did this area become dedicated entirely to pleasure and recreation.[16]

Subsequent members of the family became increasingly orientated towards the court. Sir James (1568–1619) attached himself to Sir Philip Sydney, made regular appearances at Elizabeth I's birthday tournaments, and was celebrated by Edmund Spenser in *The Faerie Queene* (London, 1579). When his grandson John, 1st Viscount Scudamore (1601–71), inherited, his estates in Herefordshire extended to 13,600 acres. With a choice of houses at his disposal, Lord Scudamore, being of a reflective and bookish disposition and a friend of William Laud, later Archbishop of Canterbury, took up residence in the more modern and compact Caradoc Court, on a sandstone bluff above the Wye, near Ross.[17] As the leading Royalist in Herefordshire, Lord Scudamore was imprisoned and his Holme Lacy House fortified for Parliament during the Civil War. He claimed his estates were 'wasted' and his trees felled, but this was strenuously denied by the Parliamentary commander, Sir William Waller.[18] In 1656 John Beale, a friend of John Evelyn, who praised Scudamore as a cider-maker, also commented in passing that the Viscount was a 'great preserver of woods against the day of England's needs', suggesting perhaps that the damage inflicted by Parliament was minimal.[19]

A set of estate accounts for the year between October 1667 and September 1668 reveals that the parkland now adjoins the house and there are no further references to the remote red deer park, albeit its presence is recorded in modern place-names. A notable feature of the latest accounts is the constant attention paid to the emerging 450-acre park (Figure 3). In this year there are no references to planting, but since pigs grazed in the park during October there was presumably a useful fall of acorns and sweet chestnuts. During the summer some of the trees were lopped and coppiced for faggots and cordwood.[20]

Between 1674 and 1675 Holme Lacy House was completely rebuilt and a new garden 'in King Williams style of fortifications, surrounded by yew hedges' replaced the Tudor brick enclosures.[21] Another set of accounts for 1708–09 provides a further glimpse of the park, which was mowed for a hay crop in the summer, with bracken cut in October. Once again large timbers, which require cutting and squaring, were extracted from the park and six thousand faggots produced. The pigs seem to have disappeared, but deer were then present and there was constant attention to the pale. In the summer the park was used for quiet recreation and eight days were spent in June 1708 mowing the 'waulks'.[22]

EARLY APPRECIATION OF THE VETERAN OAKS

Holme Lacy fell on hard times in the eighteenth century with the death of the last Scudamore, the 3rd Viscount, following a fall from a horse in 1716. His widow, Frances

Figure 3. Richard Frizell's plan of Holme Lacy (1771). House and gardens are middle right with the Wilderness Pools below. The Gannah Farm and New Inclosure were within the boundaries of the earlier park. The Red Deer Pool is marked to the north of Gannah Farm.
Courtesy: British Library, London, Add. MS 36307, G24

I (daughter of Lord Digby), was caretaker for her daughter, Frances II, who married and divorced Henry Somerset, Duke of Beaufort, and afterwards married Charles Fitzroy, pre-deceasing him in 1750. Their daughter, Frances III, married Charles Howard, 11th Duke of Norfolk, in 1771 and died a 'lunatic' in 1820.[23] The Revd Stebbing Shaw, having visited Holme Lacy in 1788, referred to the £1500 of timber having been cut down during 'the time of the duchess' (1729–50) but, nevertheless, found:

> huge oaks, those venerable sons of the forest, [which] spread their umbrageous arms around our heads, and seem to lament their former numerous family, fell'd by the destructive hand of an unlawful master

an oblique reference, no doubt, to Charles Fitzroy. Looking from the house, he found:

> Its external beauties are most bewitching, from a situation replete with ceaseless variety; the view from the east end of the garden, or from the lawn, is sweetly picturesque beyond expression.[24]

The Duke of Norfolk, notwithstanding his dissolute reputation, appears to have cherished Holme Lacy and taken pride in its ancient gardens and the many old trees in the park. He was also complimented for the 'quickness and luxuriance' of the trees recently established in his plantations.[25]

Thus, against all the odds Holme Lacy emerged in the nineteenth century with several hundred acres of parkland, containing an impressive collection of veteran trees. A recent survey found nearly fifty trees with a girth of over 3.5 metres, the majority being pedunculate oaks.[26] Using the Forestry Commission's fairly generous recommendations for dating, tempered with the late Alan Mitchell's more conservative calculations, this would suggest that all these trees were planted before the death of the Duke of Norfolk in 1815.[27] However, only fifteen trees (with a girth of more than 7 metres) take us back to the age of the first viscount (d. 1671) whilst five or six of the greatest may date from the time of John Scudamore (1486–1571). It is likely that there was a programme of replanting following the rebuilding of the house in 1674–75, but if so, the survival rate has been equally poor with only a further ten trees (eight oaks and two sweet chestnuts). However, there is a suggestion on one of the earliest plans that there were avenues at Holme Lacy before the depredations of the Duchess and Charles Fitzroy (1729–82). These were, perhaps, removed in the cause of good taste. However, among the modern veterans are about fifteen trees (5–6 metres), which should date from this period. Significantly, all the veteran trees at Holme Lacy are maidens with no sign of coppicing or pollarding, indicating that they were allowed to grow in a well-protected environment – keepered and managed throughout their history.

The evidence of two discriminating visitors, both imbued with picturesque sensibilities, confirms the venerable character of the park in the late eighteenth century. John Biddulph of Ledbury Park, a merchant banker, was in the process of improving his own grounds and visited Holme Lacy in 1800. He noted in his daybook that:

> the park is very extensive and well wooded. Many of the trees are old and stag headed, which accord well with the place, giving it an air of solemn antique magnificence. There are some red deer in the park and a couple of elks from Poland.[28]

Biddulph was a friend of Price who had visited Holme Lacy in 1798 when the mansion was used as a venue for a concert during the Three Choirs Festival of that year. He was accompanied by Richard Payne Knight and after the performance:

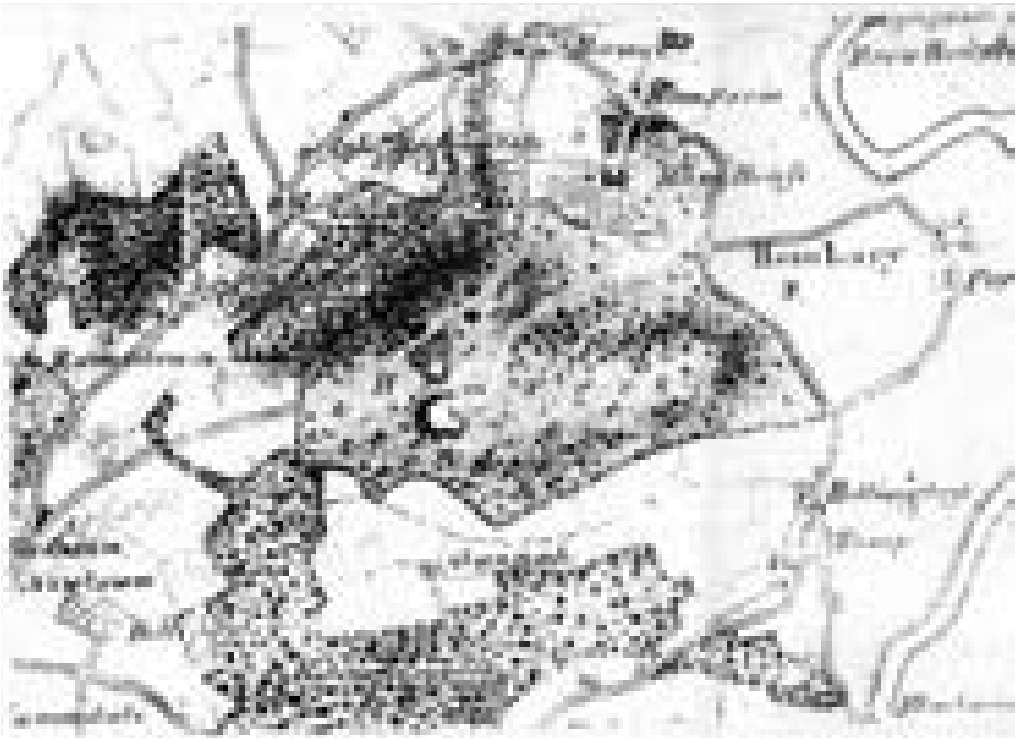

Figure 4. The Ordnance Survey original drawing at 2 inches to the mile (1815) clearly showing the new pale to the reduced park. Gannah was at the centre of the old Red Deer Park. Courtesy: British Library, London, Drawing 204, Series 163

> the music party proceeded in pleasure barges down the Wye from Holme Lacy, the excellence of the vocal performance adding greatly to the delight ever experienced from reviewing the wild and romantic scenery which adorns the river.[29]

A year later, Price was again a guest of the duke and had a riotous evening in the company of the artist Benjamin West, who was making his own Wye tour. Price, whose first *Essay on the Picturesque* … (London, 1794), extols the special qualities of veteran trees, was thus familiar with the park at Holme Lacy and, indeed, took recreation there. On a fragment of an undated late eighteenth-century map, a path is marked crossing the lower park, which is named 'Price's Walk'. At some point, Price took his good friend Sir George Beaumont there and during a walk through 'the giant oaks, fantastic witch [*sic*] elms', Beaumont seems to have been over attentive to a Mrs Wingfield, possibly a companion of the Duchess of Norfolk, who was already showing signs of insanity. In a later letter of 1820, Price warns his friend of the Duchess's impending death and fears that her heir, Sir Edwyn Stanhope, 'who has a decided aversion to the place', will simply be interested in 'how many cords of firewood the monarchs will produce'. When the 'crazy old woman' died later that year, Price once again informed Beaumont that 'the old oaks were in some danger'.[30]

PRESERVING THE PARK

Price's fears about Sir Edwyn Stanhope (who added Scudamore to his name) were unfounded. After a protracted chancery hearing he took over 2214 acres of the Holme Lacy estate, including the deer park, which had already been reduced from 450 acres to

about 250 by abandoning the ancient parkland at Gannah along the Hollington Brook. The Ordnance Surveyor's drawing of 1815 shows the new pale, hugging the high ground beyond the Upper Lodge Park, where it remains today (Figure 4). Between 1825 and 1832, Sir Edwyn refurbished the mansion, employing William Atkinson, a pupil of James Wyatt, as architect and moved in, amidst 'feasting and revelry', in July 1832.[31]

Sir Edwyn's contribution to the reduced park is unrecorded. Loudon mentions the 'old garden on the model of that at Hampton Court' but fails to record anything about the park.[32] We learn sometime later from Mr S. Welles, the forester at Holme Lacy and a correspondent of the Woolhope Club, that Sir Edwyn had planted some woodland with European larch in the early 1840s, which were subsequently thinned in 1867. Welles was a great advocate of the sessile oak (*Quercus petraea*) – 'his pet' – and defended its qualities at a meeting of the Club in 1868. He thought it produced better timber and gave a finer display in autumn. On the other hand, he admitted that it was not as fruitful as the pedunculate oak (*Quercus robur*) and when young its growth was slower. Hence, it was overlooked by both nurserymen and foresters. One of the contributors to the debate was Dr Henry Graves Bull, the Herefordshire naturalist, who pointed out that in the park at Holme Lacy it was possible to see mature specimens of both oaks side by side and, moreover, every variety between the two. The 'sessiflora', he agreed, was more ornamental in a park setting but the pedunculate had more useful timber because of its straight trunk. He mentioned the trysting oak (pedunculate) and the monarch oak (sessile), two veterans in the park at Holme Lacy, which represented unrivalled examples of the two species. The following year the latter was measured with a girth of 21 feet 10 inches at 5 feet up the trunk; the former at 25 feet seven inches.[33] Today, the two species of oaks, and many intermediate forms, can still be seen side by side, many perhaps, former 'pets' of Mr Welles.

The veteran trees at Holme Lacy were admired regularly throughout the nineteenth century. The monarch oak was depicted in an early sepia photograph in the *Woolhope Club Transactions* for 1867 and in the following year it was the turn of the Holme Lacy elm (*Ulmus campestris*) (Figures 5 and 6). This was hollow throughout, but when

Figure 5. The monarch oak (*Quercus petrea*) was listed as one of 'The Remarkable Trees of Herefordshire' by the Woolhope Naturalists Field Club. This early photograph was published in their *Transactions* for 1867. Courtesy: Woolhope Naturalists Field Club

Figure 6. 'The Holme Lacy Elm', photographed by the Woolhope Naturalists Field Club in 1868, when it measured 27 feet in circumference at 5 feet from the ground, and published in their *Transactions* for 1869. Courtesy: Woolhope Naturalists Field Club

measured using Mr Welles's 'clinometer' was found to be 104 feet tall and 27 feet in girth measured at 5 feet. There were two other veteran elms, one close to the terrace on the south front of the house and another near the western gate of the park. More curious were the 'intertwining giants' – a yew and a dead elm with the 'top of its perfectly naked trunk thrust high above the foliage of the victor Yew – like an arm of the vanquished appealing for mercy'. A pencil sketch from the *Gardener's Chronicle* was reproduced in the *Transactions* for 1873 (Figure 7).[34] The Club had visited Holme Lacy on a 'fungus foray' in October 1868 and was accompanied by Sir Edwyn. In less than an hour the members gathered 12 pounds of 'beef steaks' (*Fistulina hepatica*) from the ancient trees in the park. The veteran trees were visited in turn and, as they gained the high ground, near the monarch, they turned to enjoy 'the views of the undulating grounds of the park,

Figure 7. 'Yew and Elm. Holme Lacy Park. Hereford, 1873' – 'two giants violently struggling together'. Published by the Woolhope Naturalists Field Club in their *Transactions* for 1873, but originally from the *Gardener's Chronicle*. Courtesy: Woolhope Naturalists Field Club

of the mansion itself and the neighbouring hills, very diversified and beautiful on all sides'. They returned to the house:

> by that beautiful walk, called Price's walk – from its having been laid out by Sir Uvedale Price – a walk that takes you past such a series of noble, picturesque old oaks that can be seldom met with. They are at once the glory of Holm [*sic*] Lacy and the pride of the county, and to all lovers of forest scenery the memory of a visit to Price's walk is an abiding pleasure.[35]

In the Club's own *Flora of Herefordshire* (Hereford, 1889) several notable native trees at Holme Lacy are mentioned and, in 1877, J. Wright, a professional journalist, working for the *Journal of Horticulture and Cottage Gardener* provided names for ten other veteran oaks – the Norman, the Scudamore, the Union, the Seneschal, the Chieftain, the Warrior,

the Raven's Oak, the Earl King, the Queen Mab and the Robin Hood. No doubt, some if not all of these could be viewed from Price's Walk.[36]

Sir Edwyn died in 1874. He had clearly taken pride in the ancient trees, but had also begun the process of enhancing the picturesque scenery with well-placed exotics. Wright in 1877 mentions a group of silver fir (*Abies nordmanniana*) with girths approaching 12 feet and nearly 100 feet high. These may have been early introductions by Sir Edwyn. More firmly attributed are the Wellingtonias (*Sequoiadendron giganteum*), the first of which is recorded being planted in 1855. This was relatively early, for the seeds were only brought to England by William Lobb late in 1852. Eighteen months later in June 1854 seedlings were made available for the public by Messrs Veitch and Son. Sir Edwyn planted his 8-inch seedling in November 1855. Careful measurements were kept and in 1866 it was 18 feet tall and in 1871 (at 16 years) 21 feet tall with a girth at 5 feet of 3 feet 6 inches. So enamoured were Sir Edwyn and his heir with this new introduction, that they planted Wellingtonias all over the park. Many of these flourish today, several without any sign of lightening strikes, which often reduces the height of trees without killing them. Unfortunately, it is impossible to identify the 1855 tree.[37]

CREATING THE ARBORETUM

Sir Edwyn's son, Henry Edwyn Chandos Stanhope Scudamore, inherited the estate and became the 9th Earl of Chesterfield in 1883. According to Wright, no previous owner of Holme Lacy had discharged his duty of tree planting more conscientiously than Sir Henry. Not only was he responsible for new belts and groves of deciduous planting, but 'the splendid conifers – Wellingtonias, Deodars, etc. – which are interspersed with the grand old baronial trees are living memorials of the present baronet's innate love of trees, and his taste for grouping them effectively'.[38] Furthermore, Sir Henry believed:

> that every owner of property, such as parks and grounds wherein trees are a chief and natural feature, should plant hardy trees which are introduced to the commerce of this country during the term of his possession.

This activity, we are informed, Sir Henry commenced early in his life 'even before he attained his majority'. He also had strong ideas about displaying his new introductions, rejecting ideas of taxonomy and geographical distribution in favour of complementing the history of the park with its many veteran trees. Thus, he followed picturesque principles. Some of his conifers, Wright explains, were placed in:

> conspicuous positions and planted singly, others were in groups and groves partly hidden by larger trees and which come upon the visitor as a pleasant surprise. Indeed, this is a park of surprises, of varied, bold, and romantic scenery. In one part a bold bluff surmounted with pines commands admiration; in another a deep dell carpeted with moss, ferns and shaded by forest giants, compels a sudden pause for appreciation. Such is the nature of this cherished park where grand old timber trees of this and thriving conifers from other countries blend and beautify.

The late nineteenth-century Ordnance Survey plans, with their usual accuracy, pinpoint exactly where Sir Henry enhanced his park with new introductions and less common natives (Figure 8). The new southern boundary of the park was planted with conifers but, as a result of extensive felling since the 1960s, little survives. Scots pine, European larch and the occasional Cedar of Lebanon were certainly used, but Wright refers to 'choice cupressuses' and *Thuja Lobbiana* (*plicata*) elsewhere, apparently mixed with pedunculate oak. More ornamental was the 'deep dell' immediately opposite the south front of the

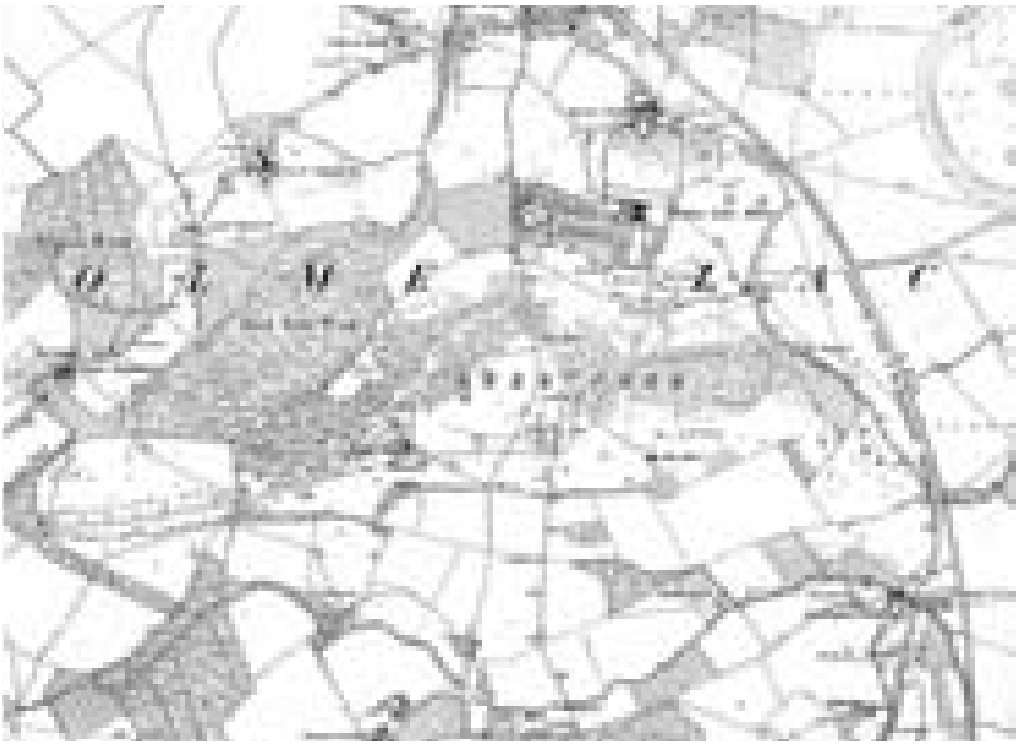

Figure 8. The 1886, 6-inch Ordnance Survey map for Holme Lacy Park. Although barely visible to the naked eye, the new introductions are already indicated by groups of conifers in the Lower Park in front of the house and to the south-west of the Green Drive

mansion, where the steep slope was dissected by a small stream in a deep ravine. On the brow of the hill stands the Monarch oak – forgotten and ignored today – which Sir Henry used as the anchor of his new composition. He grasped the picturesque circumstances of the location by throwing a bridge over the ravine and scattering a collection of ornamentals around the setting. Today, all that survives in the midst of a Douglas fir forest planted in the 1960s is a Cedar of Lebanon, a coastal redwood (*Sequoia sempervirens*), a hornbeam (*Carpinus betulus*) and a horse chestnut (*Aesculus hippocastanum*) – all fine specimens – framing the Monarch on the east slope of the stream. Neglect and the encroaching commercial forest would have eradicated any exotic of more modest growth, but enough survives for one to appreciate Sir Henry's efforts. No doubt Price would have joined in the applause, for his Walk passes just below.[39]

The late nineteenth-century plans show that there were other areas on the slopes opposite the house where new planting took place. In the midst of the forest, perhaps 200 metres from the dell, there are two champion Wellingtonias, enjoying the microclimate created by the forty-year-old firs. Underneath their canopy there are many other bleached wrecks of unknown parkland trees. Some indication of the diversity of Sir Henry's planting can be seen in the surviving parkland below the forest (Figure 9). Here, amidst some of the finest veteran oaks – sessile and pedunculate – we find Cedar of Lebanon (*Cedrus libani*), blue atlas cedar (*Cedrus atlantica var glauca*), Scots pine (*Pinus sylvestris*), Wellingtonia, London plane (*Platanus × acerfolia*), sweet chestnut (*Castanea sativa*), mature Douglas fir (*Pseudotsuga menziesii*), silver fir (*Abies nordmanniana*), red oak (*Quercus rubra*), a massive common lime (*Tilia × europaea*) and a beech (*Fagus sylvatica*). Again, the exciting evergreens have not survived, but in 1877 there were examples of Swiss stone

Figure 9. Sepia photograph of *c.*1870 from the Scudamore Family Album at Kentchurch Court. The Upper and Lower Wilderness Pools have carefully manicured margins. The house is hidden by mature trees and there are few signs of new planting apart from a juvenile Wellingtonia to the right of the Lower Pool and a young cedar partly obscured in the right foreground. Courtesy: Mrs J. Lucas Scudamore

pine (*Pinus cembra*), Spanish fir (*Abies pinsapo*), Montezuma pine (*Pinus hartwegii*) and the blue pine (*Pinus wallichiana*), which along with others unnamed had 'grown in the same satisfactory manner'. This was indeed, a true arboretum.[40]

Perhaps the most successful area of Sir Henry's planting, and one that still impresses today, was laid out either side of the Green Drive, which drops towards the house from the West Park. This replaced an earlier drive in the late eighteenth century and was presumably created by the Duke of Norfolk. It was designed to take in a large segment of the estate and begins some two miles to the west at Newtown Grove. As it enters the deer park and takes the easiest gradient down to the back of the house, it embraces John Evelyn's utopian landscape of the 'rich vales and ravishing varieties', with Backbury Hill beyond and the broad valleys of the Wye and Lugg in the foreground.[41] This is the quintessential Herefordshire countryside but, moreover, as the carriage moved quietly over the turf, which presumably gave the drive its name, the immediate hinterland contained some of Holme Lacey's finest veterans – oaks of all sorts, sweet chestnuts, and small leaved limes (*Tilia cordata*). The temptation to augment this landscape, already presumably, a show place was irresistible and Sir Henry surrendered to the temptation. Apart from the veterans, most of the trees in the West Park – oak, ash, lime, and sweet chestnut – date from the mid-nineteenth century and make this the best-preserved area of parkland at Holme Lacy. On the upper slopes, along the Green Drive, Sir Henry planted his exotics. Once again, only the most durable survive but these include many favourites encountered elsewhere on the estate, e.g. noble fir, coastal redwood, Wellingtonia, Cedar of Lebanon, red oak and horse chestnut together with monkey puzzle (*Araucaria araucana*), Lawson cypress (*Chamaecyparis lawsonia*) and western red cedar (*Thuja plicata*). The bleached skeletal remains of several other single-stemmed trees suggest there were many more

Figure 10. Looking westwards along the terrace in *c.*1870 showing the early eighteenth-century orangery, backed and flanked by its shrubbery. Various exotics are already present here, including the tulip tree (*Lirodendron tulipifera*) in the foreground. Courtesy: Mrs J. Lucas Scudamore

conifers, long deceased. Today, the area is used as a pheasant shoot and being enclosed is overgrown with brambles and young sycamores. Half a century ago it was a mature linear arboretum displaying four centuries of planting, enhanced by the eclectic taste of Sir Henry Stanhope Scudamore.[42]

In 1877 Wright walked westwards along the south terrace of the mansion. He passed the early eighteenth-century orangery on his right and noticed a maritime pine (*Pinus pinaster*) to his left in the Dutch Garden – 'common enough', he commented, 'but a specimen of such imposing dimensions is rarely seen'. It survives today and was recorded by the late Alan Mitchell as a 'notable tree'. Beyond the orangery the formal grounds were overlooked on the north by a shrubbery backed with tall trees (Figure 10). Amidst 'variegated hollies, choice cupressusses and retinosporas (*Chamaecyparis*)', Wright found a 'rare, unequalled' *Planera Richardi*, better known as a *Zelkova carpinifolia*, its oval-shaped head 80 feet (25 m) across – 'a finer example is not to be found in England'. Nearby was a Nootka cypress (*Chamaecyparis nootkatensis*), which arrived in Britain in 1853 along with the western red cedar, which was also present. Further along was a good specimen of the swamp cypress (*Taxodium distichum*) and the tulip tree (*Liriodendron tulipifera*), both introduced from North America in the seventeenth century and thus, perhaps, part of the Duke of Norfolk's planting. His special affection for the formal gardens is recorded in 1788. The terrace walk ended at the walled garden where a group of red-stemmed Scotch pines (*Pinus sylvestris*) rose up from a bank of yews. Today, the Scotch pines remain along with tall limes and oaks, but the area has been reduced in size to provide a car park for the hotel. Little of the diversity recorded in 1877 survives or any sign of the champion trees.[43]

Like most Victorian horticultural journalists, Wright made few allowances for his cottage garden readers. The detailed reporting is often almost impenetrable and there were few areas of the park and pleasure grounds that escaped his notice. He did, however, overlook the shrubbery below the Lower Wilderness Pool – a name, which suggests a long history as a wild garden – where Sir Henry was once again busy augmenting the planting. The area around the pool, which was impounded with a substantial dam, was developed as a typical Victorian shrubbery. Several veteran oaks again provided the backbone for a collection of decorative trees, underplanted with rhododendrons and berberis. Two large Wellingtonias perhaps provide a convenient *terminus a quo* of 1855, but in addition there are two copper beeches (*Fagus sylvatica 'purpurea'*), a noble fir (*Abies procera*), red oak (*Quercus rubra*) and, nearby, a fine free-standing Cedar of Lebanon. Again, the surviving trees must represent only a small fraction of the original planting, most of which has failed to survive 150 English winters and wet summers. Recently, this area has been designated a nature reserve, which could be a mixed blessing for the exotic evergreens.[44]

We are told that all the trees that Sir Henry planted were 'duly registered; their height being entered at the time of planting, and any other point of import connected with them'. A tree book for Holme Lacy was recorded in 1985 and then still in the possession of the Lucas-Scudamore family at Kentchurch Court in Herefordshire, but after an extensive search there is no sign of it today.[45] We can only be thankful that so much exists on the ground at Holme Lacy and trust that the present owners of the park – the Pershore Group of Colleges – will find the energy and the finance to maintain, and perhaps restore, this unique concept of an arboretum planted with a picturesque eye in the midst of a park of veteran trees.

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SOPHIE PIEBENGA AND SIMON TOOMER

WESTONBIRT ARBORETUM: FROM PRIVATE, NINETEENTH-CENTURY ESTATE COLLECTION TO NATIONAL ARBORETUM

The National Arboretum at Westonbirt, Gloucestershire, was originally part of a large estate. The estate plantations were initially intended for fox and game cover, but were increasingly employed to accommodate a vast range of newly imported trees and shrubs. The collection was developed, from the 1850s onwards, by Robert Stayner Holford, who was inspired by the picturesque style of planting as advocated by the landscape gardener William Sawrey Gilpin. Under Holford's son, George Lindsay Holford, the collection continued to expand. Its wider scientific value was confirmed by the publication, in 1927, of the first Catalogue of the Trees & Shrubs *at Westonbirt, compiled by the botanist Albert Bruce Jackson. After George Holford's death in 1926, the arboretum was separated from the rest of the estate. The collection continued to develop, however, during the ownership of the 4th Earl of Morley and under the guidance of curator William J. Mitchell, assisted by Jackson. Lord Morley's descendants passed the arboretum to the Treasury, which, in turn, passed it, in 1956, to the Forestry Commission. Since then, the Forestry Commission has had to balance the scientific value of the tree collection with the need to accommodate thousands of visitors each year, while at the same time paying heed to the unique, historic planting style employed by R. S. Holford.*

Covering 250 hectares (600 acres), Westonbirt Arboretum is one of the largest arboreta in the country. It lies in the heart of the Cotswolds between Bath and Cirencester, three miles to the south-west of Tetbury. The arboretum forms part of the English Heritage Registered Grade I landscape of Westonbirt and is owned and managed by the Forestry Commission (Figure 1). It was awarded National Arboretum status in 2001.

Modern management aims to conserve and enhance both the heritage and scientific significances of Westonbirt Arboretum, while meeting the broader recreational and educational objectives of the Forestry Commission. Management of the trees and landscape is defined through various plans and policies including, at their centre, a Forest Design Plan and Landscape Plan. Accessioning of plants aims to strike a balance between preserving the historically significant, while continuing to acquire the new and unusual in the Holford tradition. The Friends of Westonbirt Arboretum was set up in 1985 as a charity to support the Forestry Commission in its management. Its members now number over twenty thousand and, as well as providing valuable income, support the Arboretum through a wide range of voluntary work. About three hundred thousand people visit the Arboretum annually and the income derived from them represents the primary source of funding.

Sophie Piebenga, 37 Somerford Road, Cirencester, Gloucestershire GL7 1TP, UK
Simon Toomer, The National Arboretum, Westonbirt, Tetbury, Gloucestershire GL8 8QS, UK

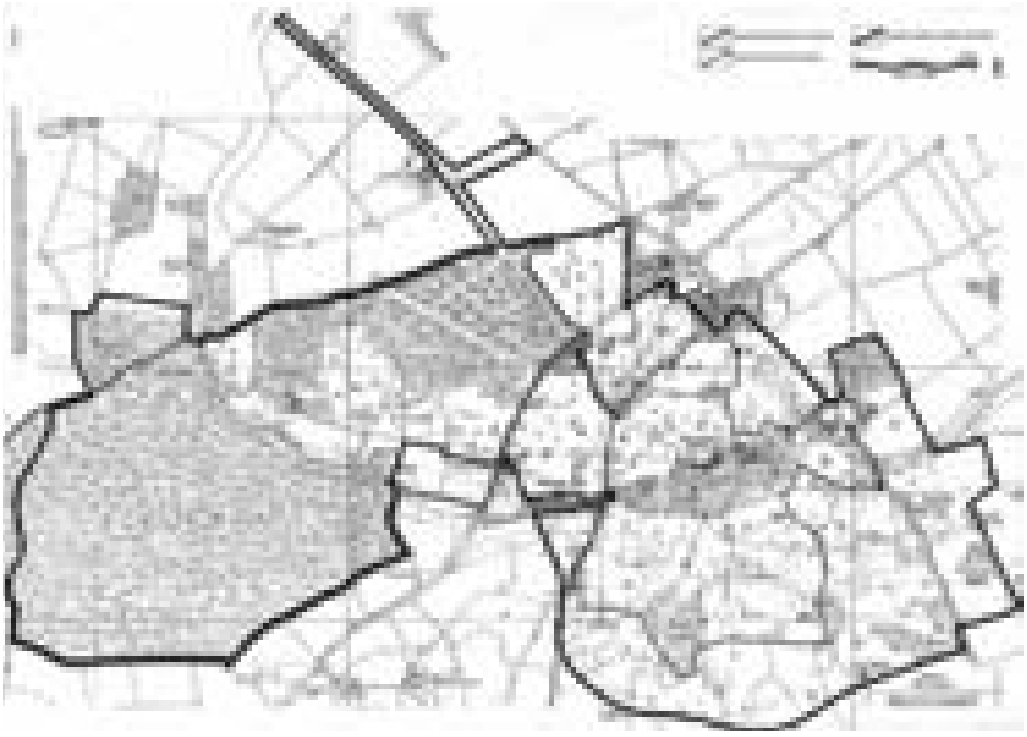

Figure 1. Westonbirt – extent of the English Heritage Grade I Registered landscape, encompassing gardens and parkland to east, and arboretum (including Silk Wood) to the west. The boundaries of the National Arboretum are indicated by the broken line. Courtesy: Nicholas Pearson Associates 'Westonbirt Arboretum and Gardens. Historic Landscape Survey' (2003)

The National Arboretum at Westonbirt, however, started as the private tree collection of a Victorian 'millionaire', Robert Stayner Holford. Being the 'indulgence' of a nineteenth-century individual is, of course, a far cry from being a hugely popular visitor attraction in the twenty-first century, in the care of a national body. This paper describes how the historic tree collection of Westonbirt Arboretum developed and how it not only survived this transformation, but also continues to evolve.

ROBERT STAYNER HOLFORD (1808–92)

The estate of Westonbirt in Gloucestershire came to the Holford family, by means of marriage, in the mid-seventeenth century.[1] Sir Richard Holford (*c*.1633–1714), a Master in Chancery, resided in London and managed the estate as an absentee landlord. His great-grandson George Peter Holford (d. 1839), a fourth-generation Master in Chancery, completely remodelled the property at the beginning of the nineteenth century.[2] He replaced the old manor with a Regency house and laid out a small belted park. Sometime during the 1820s or 1830s he also employed the landscape gardener and painter William Sawrey Gilpin (1761/62–1843), who assisted with the plantations in the new park and almost certainly advised on the original terrace walk in the pleasure garden.[3] Some sixty years later, in 1886, the garden journalist William Goldring was able to observe that, although 'much planting and thinning have been done since … the main ideas of Gilpin have not been disturbed'.[4]

George Peter Holford's son, Robert Stayner Holford (1808–92), might well have assisted his father with these improvements to the park and garden (Figure 2). Educated

at Oriel College, Oxford, upon his coming of age in 1829, R. S. Holford reputedly asked his father for a piece of land for planting.[5] Consequently, the tract of land that is called 'Down Plantation' on the 1839 tithe map was planted (Figure 3).[6] (Likewise, when Robert's own son George came of age in 1881, Upton Plantation was planted.[7]) However, the later name of this plantation, 'Down Covert', strongly suggests that its function was primarily to provide cover for game, as opposed to accommodating ornamental trees and shrubs. Apart from the fact that it was a considerable distance from the house and pleasure garden, Holford makes no reference to it in his own detailed notebook. Nevertheless, there can be no doubt that Robert Holford did have an early interest in trees, as it was he, rather than his father, who, in 1834, returned John Claudius Loudon's 'questionnaire' on trees, the information thus gained contributing to Loudon's subsequent *Arboretum et Fruticetum Britannicum* (London, 1838).[8]

Apart from inheriting, upon the death of his father in 1839, the Westonbirt Estate, Robert Stayner Holford was also left several properties and a large sum of money by his bachelor uncle (also named Robert Holford). At the same time, shares in the New River Company continued to pay off handsomely. Thus backed by enormous wealth, R. S. Holford, barely into his thirties, was able to spend the rest of his life indulging in his two passions, trees and art, amassing enormous collections of both. He built Dorchester House in London and completely rebuilt the house at Westonbirt in order to display his many art treasures; likewise he developed extensive pleasure grounds and a huge arboretum to accommodate his trees.[9]

The (traced) tithe map of 1839 is an extremely valuable document as it shows the layout of the estate at the time that R. S. Holford inherited the property (Figure 3). Parkland surrounded the house (approached from the north-west) on its north and east sides. Park planting consisted primarily of a narrow belt with typical 'Gilpinesque' projections and a couple of plantations. Across the main Bath to Tetbury road (west of

Figure 2. Robert Stayner Holford (1808–92) *c.*1885. Courtesy: private collection

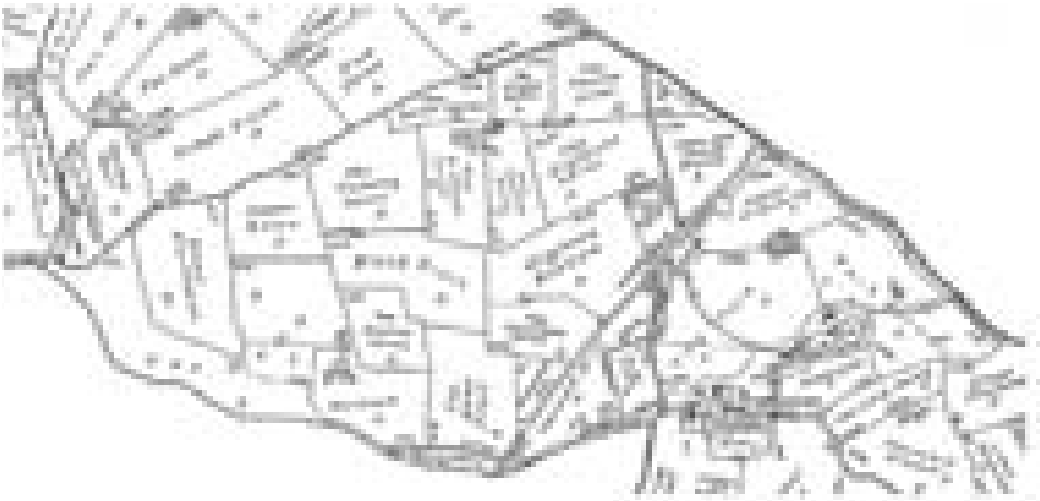

Figure 3. Tithe map (1839) (traced). The house is located centre right; the main Bath to Tetbury road runs south-west to north-east through the middle; Down Plantation is located to the far left. Pl, plantation; P, pasture; A, arable. Courtesy: Gloucestershire Archives PC1812/36

the house, running south-west to north-east), arable fields covered most of the area of what is now the Arboretum. Pasture (The Down and Upper Down) surrounded the only plantation of note – Down Plantation, planted in 1829 (see above).

Upon inheriting the estate, Holford initially concentrated upon extensive improvements to the pleasure grounds adjoining the house to the south, assisted by his land agent Edmund Rich (appointed in 1841), the architect Lewis Vulliamy and the landscape gardener William Broderick Thomas.[10] Some of the earliest plantings were recorded in a notebook kept by one of the gardeners, Jonah Neale.[11] Another invaluable document is the notebook kept by Robert Holford himself, recording, amongst other miscellaneous facts and figures, dates of planting (Figure 4).[12] These records confirm that, not surprisingly, the first tree plantings by Holford were located in the pleasure grounds.[13]

In the early 1850s, after further land acquisition and exchanges, Holford embarked on a major landscaping scheme which involved moving the public roads, which surrounded the park, outwards, away from the house. The park was thus enlarged and the main north-west approach to the house from the Bath road extended and realigned. New entrance lodges were built on the Bath road. The boundary plantations of the old park were broken up into individual clumps and incorporated in the new enlarged park. Most significantly, Holford (whose father had employed W. S. Gilpin) consulted yet another landscape gardener *and artist*, a certain Samuel Gray, from London, on the planting adjoining the new lodges.[14] This confirms Holford's desire to plant with 'a painter's eye', or, to put it another way, to plant in a picturesque style.

INITIAL ARBORETUM LAYOUT

It was at this stage, with the park enlarged and the new lodges built, that Holford 'crossed the Bath road' and started planting what had hitherto been arable fields. In 1854–55 Down Road was laid out, starting opposite the lodges across the Bath road and running westwards to a barn in a corner of The Down (Figure 5).[15] It was most likely along this road that the first trees were planted. Holford recorded in his notebook: 'Large trees planted North of New Bath Road 1854'.[16] At the same time the avenue of trees running

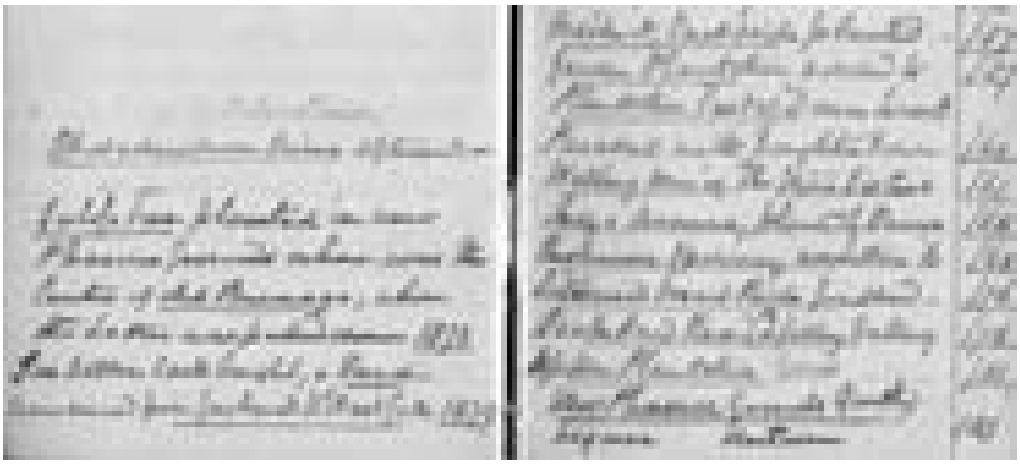

Figure 4. Part of page 17 of Robert Stayner Holford's notebook. Courtesy: private collection

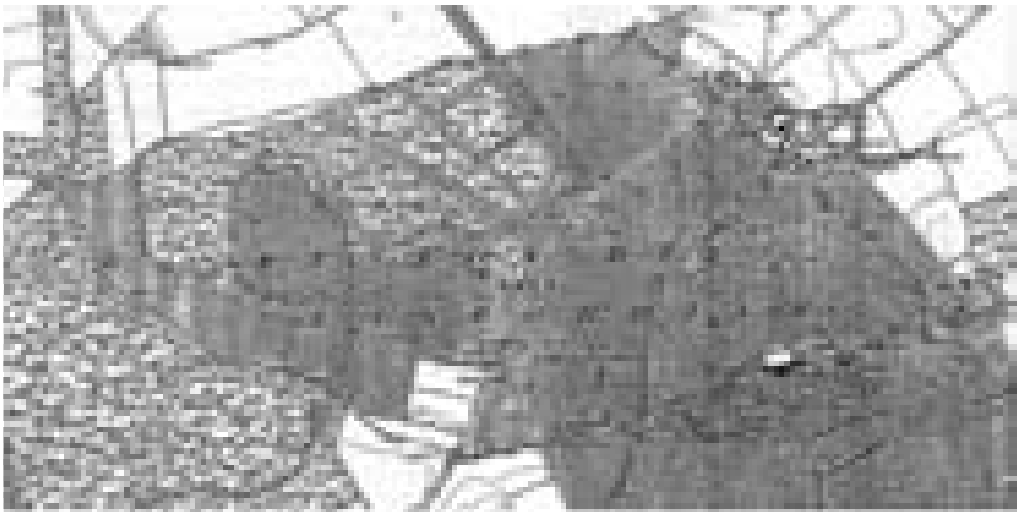

Figure 5. First edition 6-inch Ordnance Survey map (reduced) (1881), which shows the layout of the arboretum as a single plantation (with rides) north of the relocated Bath to Tetbury road. Cf. Figure 3 (1839 tithe map)

north, initially called Lodge Avenue and linking Westonbirt with Lasborough (another Holford property), was planted.[17] In 1856, Holford and his new wife Mary Anne Lindsay (d. 1901) planted, immediately opposite the new lodges, a pair of Wellingtonias. Holford recounted how these trees, purchased in 1854, were 1 foot high when planted.[18] This was followed, in 1856, by further 'general planting opposite lodges, North of [Bath] road'.[19] Another notable planting of that period are three more Wellingtonias, 'the three sisters' (after Holford's three young daughters), planted in 1861 along Down Road (Figure 6; see also Figure 4).[20] These plantings signalled the beginning of what was to become the world famous Arboretum of Westonbirt.

Both Neale and Holford refer to a plantation being laid out in 1860.[21] This is probably another example of a commemorative planting, 1860 being the year in which, after three daughters, a son and heir was born, George Lindsay Holford (1860–1926). It is most likely that the plantation in question is the large area between Down Covert and Lodge Avenue which, though arable on the 1839 tithe map, appears as planted on the first

Figure 6. Three Wellingtonias (the Three Sisters), planted in 1861, as they appeared *c.*1925; from Albert Bruce Jackson, *Catalogue of the Trees & Shrubs* (Oxford, 1927), pl. 51

edition Ordnance Survey map of 1881. This plantation, later called 'Down Plantation' (not to be confused with the earlier 'Down Plantation' which became known as 'Down Covert'), consisted largely of oak, pine, larch and sweet chestnut. It was crossed by broad rides, two of which centred on, respectively, the house and church at Westonbirt, situated on the opposite side of the Bath road. This large plantation was probably initially laid out with an eye to the hunt, and the broad rides, the presence of kennels and a gamekeeper's cottage at Down Covert, certainly support this theory. Westonbirt is in prime hunting country with the Duke of Beaufort's Hunt being based at nearby Badminton.

However, it was precisely this extensive plantation, together with Down Covert, which was to shelter the expanding tree collection and which became the 'framework' of the Arboretum. As well as providing shelter, the area also contained a large tract of greensand (more favourable to calcifuges than the Cotswold oolitic limestone present elsewhere). This will have been an additional reason for Holford to plant in this location, as opposed to extending the grounds nearer the house.

Apart from planting individual trees and an extensive plantation, tracks were laid out through the woodlands. In his notebook, Holford mentioned three different routes that could be taken through these woods (one of which incorporated Silkwood).[22] It seems likely that the earliest ornamental plantings developed, as ribbons, along these

routes. This was indeed the advice given by Loudon who, in his *Arboretum et Fruticetum Britannicum* (London, 1838), suggested that land owners should plant ornamental trees 'in the outer margins of [their] natural woods or artificial plantations, and along the open rides in them'.[23] One track (now called Main Drive) was originally known as Rhododendron Drive – a reference, no doubt, to its accompanying planting.[24]

Some thirty years after planting started, the collection of trees at Westonbirt began to attract the attention of the horticultural press. In 1881 (at the time of the first Ordnance Survey map), the *Gardeners' Chronicle* told of the 'extensive pinetum which has been the work of many years and is now near completion'.[25] Five years on *The Garden* referred to 'the Arboretum [being] … *the* feature of Westonbirt. It is one of the most important arboreta in the country, and certainly among the largest'.[26] Another decade on, its reputation seemed established as the *Journal of Horticulture and Cottage Gardener* described it as a 'superb arboretum'.[27]

Westonbirt's was certainly not the only arboretum in the area, however. Within forty miles were three other major tree collections: Thomas Gambier Parry's Highnam Pinetum, Lord Somers's Eastnor Castle and Lord Ducie's Tortworth. Other tree collectors with whom Holford associated were Lord Delamere of Vale Royal and Sir Phillip Egerton of Oulton (both in Cheshire).[28] It is not yet known to what extent these men collaborated (or indeed maintained a friendly rivalry) but, no doubt, they all exchanged plants. Writing to the director of The Royal Botanic Gardens Kew in 1883, Holford recounted how he had:

> just received some seedling plants of American oaks & other plants, from Lord Ducie, who very kindly has offered me a plant or two of Q. sonomensis … & one of Q. wislizeni. … I fear, from the locality described, that the latter may be tender.[29]

Lord Ducie had received in 1878 acorns of the Californian black oak (*Quercus sonomensis*; renamed *Q. kelloggii* Newberry) directly from San Francisco and he was obviously willing to share the resulting seedling trees.[30]

THE TREE COLLECTION

It is clear that Holford was keen to include in his collection the new introductions that were coming into the country from all corners of the Empire and beyond. Apart from fellow collectors, he obtained plants from nurseries such as Page's of Southampton and Veitch.[31] According to Sue Shephard, 'Holford's arboretum at Westonbirt … kept up a continuous order of specimens of every new tree introduced by Veitch collectors'.[32] Although Holford visited Italy on a number of occasions, there is no indication that he actually travelled further afield to collect plants himself. One newspaper source claims that Holford in fact employed a botanist to collect plants for him, but there is no evidence to support this claim, either.[33] In 1874, however, he did appoint a forester from Scotland, Thomas Rattray, specifically to look after the trees and plantations.

Holford's genuine interest in trees, and his thirst for knowledge, brought him in contact with the botanic gardens at Kew. This led to interesting correspondence with the director, Sir Joseph Hooker. On one occasion, Hooker had sent Holford a book 'on American trees' and, thanking him, Holford wrote:

> The first thing I opened on was a revelation to me. 'Quercus garryana' which I fancied was little more than a bush, & probably tender, turns out to be a tree 70 feet high growing up to Vancouver Island, & which, I presume, will be quite hardy.[34]

Barely a week later he wrote: 'I enclose a branch of Pinus Ayacahuite; the one you enclosed to me is clearly different, & looks like Strobus'.[35] Holford also exchanged plants with

Kew: 'Any of the Pines you mention will be very acceptable. I have one Contorta, but, if you can spare it, I should be glad to have [another] one'.[36]

As these letters indicate, Holford's interest in trees was certainly a botanical and scientific one. However, he was also concerned with the appearance of trees and shrubs and his observations give an early indication of the spectacular autumn colours for which Westonbirt Arboretum has since become famous:

> the Japanese Maples take fine colours in Autumn; but the two that we have finest are the type 'Palmatum' or 'Polymorphum'; & the variety called 'Septemlobum'. … In each of these there are first and second rate strains, though all are beautiful. The more cut leaved ones, reddish, and green, respectively in summer, 'Dissectum' and 'Palmatifidum' each take a splendid colour in autumn.[37]

PLANTING STYLE

As Veitch and Sons had pointed out, the actual reason for forming an arboretum or pinetum determined its style of planting.[38] If the object was to study the scientific aspect, the various trees and shrubs would be best arranged to their systematic places. If, on the other hand, the aim was to grow the trees for 'artistic effect, such as the formation of an out-of-doors winter garden, &c., [then] the arrangement would be that which is most pleasing to the eye, or according to the taste of the planter'. It is clear that at Westonbirt, Holford, despite his botanical interests, subscribed to the latter cause. Goldring, writing in 1886, already noted that Holford had not planted according to a scientific plan; instead:

> trees have been planted in the spots considered at the outset to be most likely to suit them; but even here [*in the arboretum*] we see the same taste displayed in the grouping as is carried out in the more polished pleasure grounds about the house.[39]

This particular 'taste', Holford's taste, could very well be described as picturesque in the original sense of the word. As Goldring reported, 'Mr Holford's aim [in planting] has been to create variety without confusion, [to create] informality and picturesqueness'.[40] This is very much in line with the picturesque style of landscape gardening advocated by William Sawrey Gilpin. Holford was, of course, well acquainted with Gilpin's work, the latter, as we have seen, having been employed at Westonbirt in the 1820s or 1830s. Even though Gilpin had died by the time Holford started his Arboretum in the 1850s, he still adhered to the picturesque style – witness his employing Samuel Gray.

In his *Practical Hints upon Landscape Gardening* (London, 1832), a copy of which was in the Holford library, Gilpin had named the key elements of the picturesque style as variety, connection and intricacy.[41] Variety, for example, was to be found in the outline of plantations (i.e. recesses and projections); in the shape and colour of adjacent trees; in the contrast between dense and open plantings, between light and shaded walks. The absolute abhorrence of the picturesque landscape gardener was monotony and dullness – these were to be avoided at all costs. Connection between the different elements in a landscape was important, in order to achieve a 'harmonious whole' (cf. creating a picture).

It is especially the two picturesque principles of variety and connection that are important, recurring elements in R. S. Holford's style of planting. Goldring's descriptions of Westonbirt in his 1886 article show how closely Holford followed the picturesque style so strongly promoted and practised by W. S. Gilpin: 'the outline of the vista is not monotonous; here the shrubbery projects, there it recedes; at one point some favourite tree is made to stand out boldly, as if to emphasise the projection'.[42] Furthermore, 'nowhere

can be seen harsh or monotonous lines; the skyline is always broken by columnar trees'. It was only by 'breaking up the masses in recesses and projecting points' that one could 'get the full effect of light and shade so essential to effective garden landscape'. Today, one can still see many examples of this picturesque 'variety' in the planting at Westonbirt. Tall, dark, incense cedars are flanked by broad, deciduous *Parottia persica* (Figure 7). The planting along the main ride, Holford Ride, is alternately receding and projecting (Figure 8).

Unlike Gilpin, who worked during the 1820s and 1830s, R. S. Holford had at his disposal a huge assortment of trees. Having such a wide range of plant material could easily have resulted in a 'bitty' display, disharmonious and 'unconnected'. Holford, however, managed to create a 'harmonious whole' by using yew and other evergreens such as rhododendron, as background planting. These plantings linked, or connected, the various new introductions, while at the same time showing them off to the best of their ability (Figure 9). In the *Catalogue of the Trees & Shrubs* (Oxford, 1927) at Westonbirt, Albert Bruce Jackson stated:

> the charm of Westonbirt lies not so much in the number of species represented and in the beauty and symmetry of the individual specimen, as in the skilful manner in which evergreens, like yew and box, have been used as a background so that each plant or group of plants stands in a perfect setting.[43]

Indeed, it is Holford's 'skilful manner of planting' that sets Westonbirt apart from other tree collections. When R. S. Holford died in 1892, after a lengthy illness, the estate was passed on to his son George.

Figure 7. The picturesque element of variety: incense cedars contrasting in colour, shape and size with *Parrotia persica*

Figure 8. The outline of the planting along Holford Ride shows typical picturesque recessions and projections

GEORGE LINDSAY HOLFORD (1860–1926)

George Lindsay Holford inherited not only the Westonbirt estate, but also, luckily, his father's enthusiasm for plants. However, his role as equerry to several members of the Royal family, including Edward VII, dictated his absence from Westonbirt for long periods at a time. Nevertheless, Holford was keen to continue his father's work. Apart from trees and shrubs he also developed a particular interest in *Hippeastrum* and orchids. He was a regular contributor to the shows of the Royal Horticultural Society, of which he became a Council member. Holford consequently moved in horticultural circles and this is reflected by entries in the Westonbirt visitor books, which include Augustine Henry (botanist and co-author of the seven-volume *The Trees of Great Britain and Ireland* (Edinburgh, 1906–13)), Sir Trevor Lawrence (President of the Royal Horticultural Society), Reginald Cory (of Dyffryn gardens in Wales), and E. Augustus Bowles (of Myddleton House).[44]

A useful record from Sir George's era (he was knighted in 1910) is a small planting book dating from 1894–1920.[45] It was possibly commenced by the forester Thomas Rattray and includes lists of trees and shrubs acquired as well as more general observations on plants and weather conditions. It indicates the wide variety of sources of trees: nurseries such as Waterer's, Hillier's, Jefferies', and White's of Sunningdale were regular suppliers, as was Reginald Cory of Dyffryn. Sir George also subscribed to plant-hunting expeditions. As the *Journal of Horticulture* (1897) reported: 'specimens of several [conifers and other trees] represent the products of the first consignments that came into this country'.[46] Seeds from Ernest H. Wilson's 1910 expedition to Western China found their way to Westonbirt, as did numerous batches of rhododendron seeds collected by Reginald Farrer *c.*1920.[47]

Figure 9. Sir George Holford posing beside a *Paulownia*, planted against a characteristic background of yew; from Albert Bruce Jackson, *Catalogue of the Trees & Shrubs* (Oxford, 1927)

Rhododendrons became Sir George's particular interest (besides orchids) and the collection kept expanding. In 1907 an article in *Country Life* reported:

> The rhododendrons, happily growing in suitable soil, are of great magnificence, and every kind is represented. The variety of conifers is truly astonishing and Mr Holford and his son have been singularly successful, not only in growing them to perfection, but in grouping them with admirable skill.[48]

The extent of the collection and other plantations on the estate can be measured by the twenty woodsmen who were employed in Edwardian times (in addition to the fifty gardeners), out of a total of two hundred employees.[49]

JACKSON'S CATALOGUE

The exchange of plants with the botanic gardens at Kew continued. In the same way that his father had corresponded with the then director of Kew, Sir Joseph Hooker, so George Holford continued to maintain contact with the next director, Sir William Thiselton-Dyer. In 1898 George Holford referred to a recent visit to Westonbirt by Thiselton-Dyer:

> I need not tell you how very pleased I was at the very kind remarks you made about Westonbirt, its gardens and arboretum. It is pleasant to see the results of my dear father's years of labour so thoroughly appreciated by one who understands.[50]

Thiselton-Dyer clearly regarded the collection of trees and shrubs grown at Westonbirt of considerable value and had urged Holford to keep proper records. George Holford continued:

> I will certainly take your advice about having a catalogue made of the trees & shrubs; In fact I have left instructions with Chapman [head gardener] & Rattray [forester] to begin

Figure 10. Title page of Albert Bruce Jackson, *Catalogue of the Trees & Shrubs* (Oxford, 1927)

> it …; and when I have got it shipshape, I shall take advantage of your kind offer to revise it at Kew. The hand lists you sent me will be of the greatest use in doing this.

The Kew hand lists were indeed used for the catalogue but not until some twenty years later when the well-respected botanist Albert Bruce Jackson (1876–1947) embarked on the production of a complete catalogue, which was to culminate in the publication, in 1927, of the first official *Catalogue of the Trees & Shrubs* at Westonbirt (Figure 10).

Jackson was a botanist who had assisted Henry and Elwes with their monumental work *The Trees of Great Britain and Ireland* (1906). He was employed, first at the Imperial Institute and later, on a part-time basis, at the Botany Department of The Natural History Museum.[51] Jackson had worked on catalogues of woody plants for the Duke of Northumberland's properties at both Syon House (1910) and Albury Park (*c.*1913). He had also advised, since 1914, on the development of a new pinetum at Woburn. In addition, Jackson was author of various writings on conifers, amongst which (with W. Dallimore) was *A Handbook of Coniferae* (London, 1923).[52] He first visited Westonbirt in 1908, but probably did not start work on the catalogue until the early 1920s when his name appears in the visitor book more regularly, usually indicating stays of several days.[53] His visits often coincided with those by another prominent figure of the horticultural world, F. R. S. Balfour.[54] Balfour, a keen planter and collector, was the owner of Dawyck, near Peebles in the Scottish borders. During their stay at Westonbirt in October 1923, Balfour and Jackson were joined by yet another leading botanist and author, W. J. Bean.

The tree collection at Westonbirt became more widely known and appreciated. The publication of the first official *Catalogue of the Trees & Shrubs*, listing at least seven hundred different species, confirmed Westonbirt as a nationally important collection of trees and shrubs. The Duke of Beaufort Hunt would still ride through Silkwood and the surrounding plantations, but during Sir George's ownership the wider, scientific significance of the collection was increasingly being recognized.[55]

THE ARBORETUM – A LIFE OF ITS OWN

George Lindsay Holford died after a short illness in 1926. Having no issue, the estate passed to his nephew, Edmund Robert Parker, 4th Earl of Morley (1877–1951). Lord Morley, a keen gardener himself:

Plate 1. A rare hand-coloured edition of John C. Loudon's *Arboretum et Fruticetum Britannicum*, 8 vols (London, 1838), with, below, plate XXXIa: 'The scarlet-*fruited* Thorn.' Courtesy: Donald Heald Rare Books, New York

Plate II. View across the lake in very wet conditions at the Späth Arboretum, near Berlin

Plate III. Modern labelling in the Spath Arboretum, near Berlin

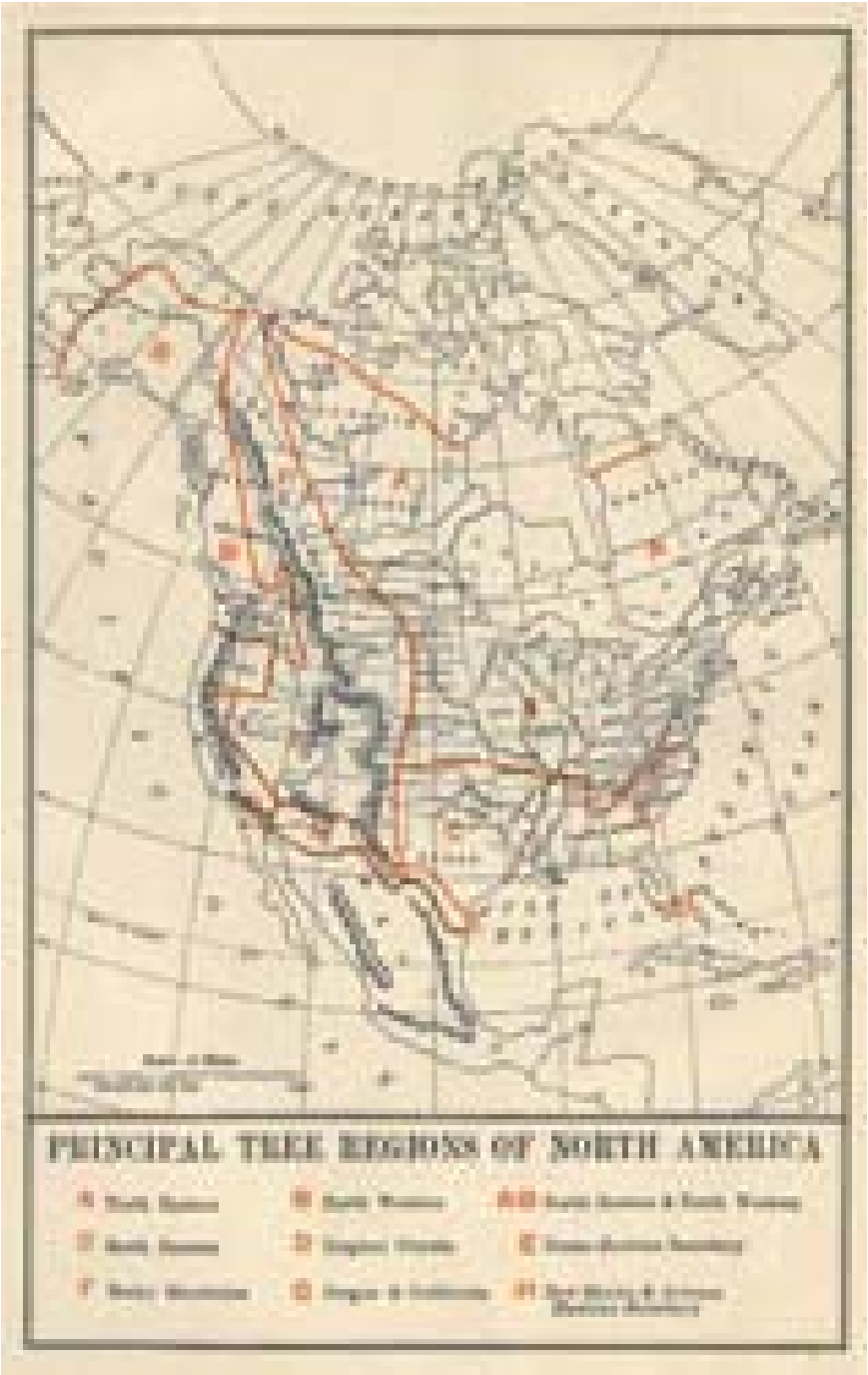

Plate IV. 'Principal Tree Regions of North America'; from Charles Sargent, *Manual of the Trees of North America* (New York, 1905)

Plate V. Monkey puzzle on a mound in the pinetum at Biddulph Grange, Staffordshire

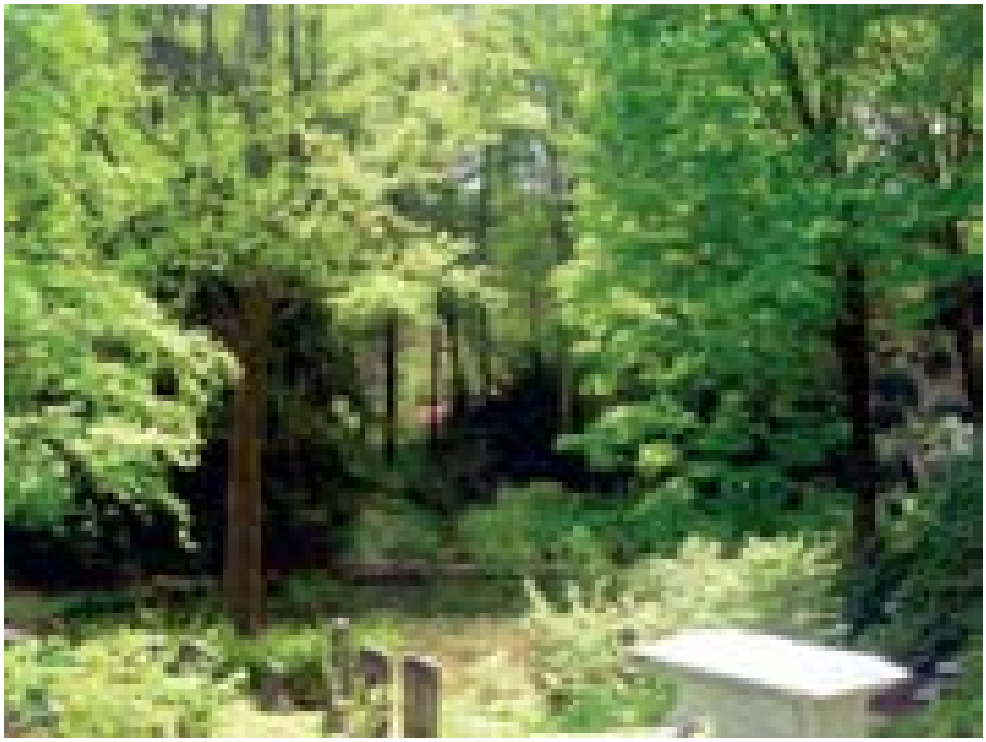

Plate VI. Consecration Dell in Mount Auburn Cemetery, Cambridge, Massachusetts

Plate VII. Abney Park Cemetery, Stoke Newington

Plate VIII. '*A Survey of the Botanic Garden at Glasnevin in the County of Dublin …*' (1800) by Thomas Sherrard; from Walter Wade, *Catalogue of Plants in the Dublin Society's Botanic Garden, Glasnevin* (Dublin: Graisberry, 1800)

Plate IX. Mutlow's plan (1818) of the Royal Botanic Gardens, Glasnevin; from J. Warburton, J. Whitelaw and R. Walsh, *History of the City of Dublin* (London: T. Cadell & W. Davies, 1818)

Plate X. Evergreens and topiary at Elvaston Castle, Derbyshire. Photos: Paul Elliott

Plate XI. Rockwork and planting, and yews and rocks beside the lake at Elvaston Castle, Derbyshire

Plate XII. William Barron's nursery and house Borrowash, near Derby, shown on the Ordnance Survey map of 1881. Courtesy: Derby Local Studies Library

Plate XIII. View across the golden gates towards the pinetum at Elvaston Castle, Derbyshire

Plate XIV. Rockwork and mounds at West Park in Macclesfield, Cheshire

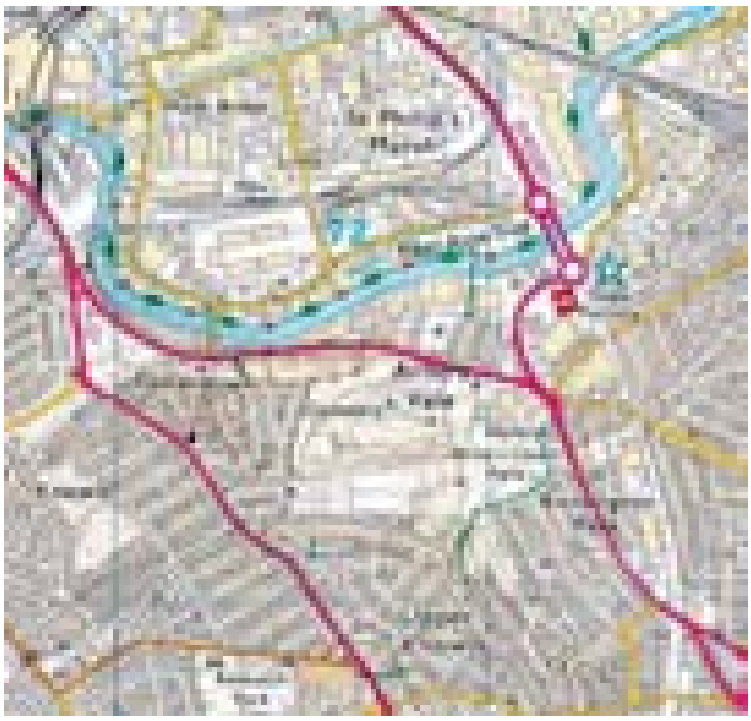

Plate XV. Location of Arnos Vale Cemetery, Bristol; reproduced from Ordnance Survey map data by permission of Ordnance Survey, Crown copyright

Plate XIV. Arnos Vale Cemetery showing the extent of tree cover. Photo: author, 1999

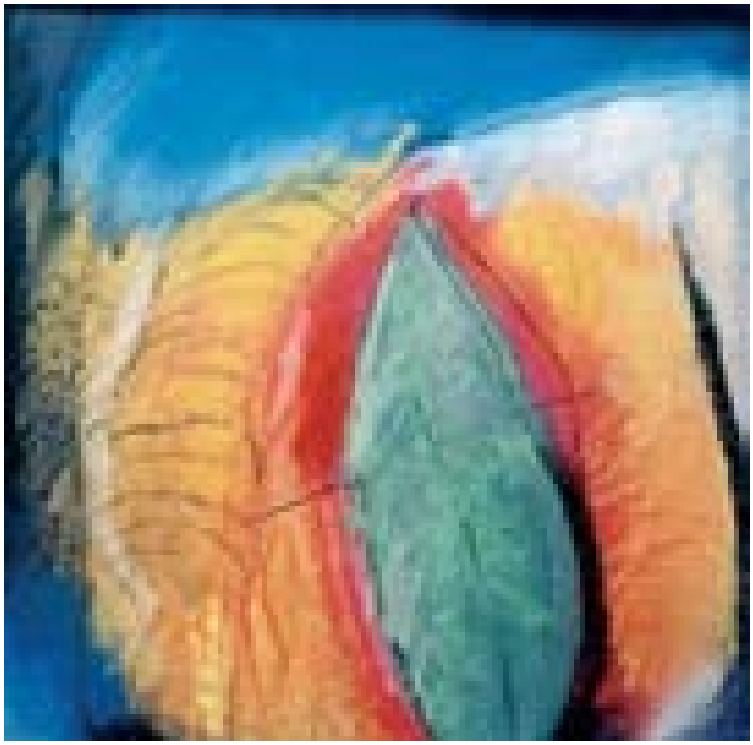

Plate XVII. Graham Lowe, *Root* (2004), acrylic on canvas

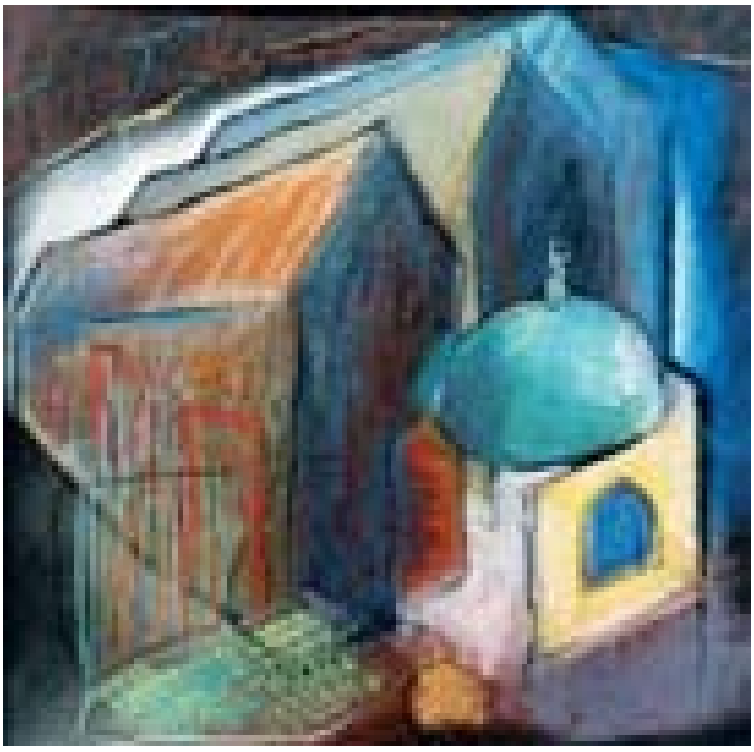

Plate XVIII. Graham Lowe, *Community* (2004), acrylic on canvas

Plate XIX. J. Poole Addey, *Avondale* (*c.*1880–90), watercolour

Exotic planting at Alton Towers, Staffordshire; detail from E. Adveno Brooke, *The Gardens of England* (London: T. McLean, 1857). Courtesy: Derby Local Studies Library, Irongate, Derby

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(OVERLEAF) Plate XX. Plan of Avondale; from *Avondale House and Forest Park; A Guide to the Forest Park* [brochure] (Coillte)

HOUSE A

Plate XXI. Cartwright's '*A Plan of the Governor's Demesne Land Surveyed in the Year 1816*' (*c.*1816); Mitchell Library, State Library of New South Wales, Sydney

Plate XXII. 'Arboretum and Eventual Botanical Reserves Canberra' (1913), a drawing showing details of plantings from the continents; from *The Griffin Legacy* (National Capital Authority, 2004), p. 87

Plate XXIII. One of the species trials plantations today (cork oaks, *Quercus suber*).
Photo: M. Bourke

> was already possessed of a very nice estate in Devon [Saltram, near Plympton] and a town house in London, and as he only received the entailed land and house property, it was not surprising he eventually found means to dispose of his legacy.[56]

In the post-First World War climate of the late 1920s, Lord Morley put up for sale the whole of the Westonbirt estate, with the exception of the Arboretum – this he retained, no doubt because of his strong interest in trees and shrubs. The house and pleasure grounds were eventually bought by the Revd P. E. Warrington and turned into a school. Meanwhile, the Arboretum across the Bath road was embarking on a life of its own under the curatorship of William John Mitchell.

Mitchell (b. *c.*1876) had started out as a garden boy at Saltram and had moved to Westonbirt in the early 1900s.[57] By the time of Sir George's death in 1926, Mitchell had worked his way up to Head of Gardens.[58] With the pleasure grounds being sold off and possibly facing an uncertain future as school grounds, it is likely that Mitchell decided to devote his energies to the development of the tree collection in the Arboretum. In this he was no doubt strongly supported and encouraged by Jackson who continued to advise and keep the catalogue up to date.[59] Jackson also ensured the development of the collection, forwarding numerous tree seeds and aiding in the identification of new specimens.[60] In 1933 he named *Pinus* × *holfordiana* as a new hybrid (a cross between *P. ayacahuite* var. *veitchii* and *P. wallichiana* syn. *excelsa*), after the late Sir George Holford (Figure 11).[61]

Mitchell, as curator of the arboretum, started to keep consistent and detailed planting records: his lists of trees and seeds received (1928–29) and five volumes of planting books (1927–53) are still kept at the arboretum to this day. The source and size of any new plants and their location in the arboretum were all meticulously recorded. The planting book included entries such as:

Figure 11. *Pinus* × *holfordiana* with typical silvery-grey, long needles and large cone. Courtesy: Hugh Angus

> Juglans sieboldiana planted in Hickory collection in Silkwood 13.12.27. The seed of this and those planted at bottom of Acer Glade was sent from Tortworth and collected from a tree sent there under that name by F. R. S. Balfour Esq.[62]

In the winter of 1928 Mitchell also transplanted a number of trees (among them a fastigiate Dawyck beech) from the pleasure grounds to the Arboretum, before the former was sold off. From the planting books it is clear that the influx of plants continued unabated, the range of sources including Hillier's of Winchester, Yokohama Nursery Co., James Harris and Son, and Major Lawrence Johnston of Hidcote. Mitchell's training as a gardener rather than a forester, encouraged him to add many smaller, more ornamental plantings, including heathers. In 1947 Mitchell, 'for many years … in charge of the famous arboretum at Westonbirt', was awarded the Royal Horticultural Society's Victoria Medal of Honour in recognition of his invaluable work.[63]

The Second World War led to a certain amount of neglect and when the 4th Earl of Morley died in 1951, without issue, the arboretum was passed to his descendants who, in due course, handed the property over to the Treasury in lieu of death duties.[64] By March 1953 it became apparent that the celebrated arboretum of Westonbirt could well be passed over to the Forestry Commission.[65] This caused Arthur Hellyer, garden correspondent for *Country Life*, to lament:

> Is [Westonbirt Arboretum] to become the property of the Forestry Commission, and, if so, will its many unique and beautiful, but presumably quite useless, trees be preserved as they ought?[66]

Hellyer's concern was based on the fact that, at that time, the Forestry Commission's overriding aim was to provide a strategic timber reserve by planting fast-growing conifers. However, the organization recognized its lack of expertise in the field of 'heritage garden management' by appointing the first advisory committee to oversee its management. The early years of the Forestry Commission's stewardship saw a comprehensive programme of mapping and recording, culminating in the first database and atlas of trees and shrubs. Maintenance plans were written and the first steps towards the provision of public facilities were taken.[67] Though some previously undeveloped areas of Silk Wood were cleared and planted with forestry trial plots and single-genus collections, maintenance of the historical arboretum remained the core purpose. In recent years the importance of the historical landscape has been further recognized with the production of the Landscape Plan, the guidelines and principles of which are being applied to regenerate areas of early planting.

Over the years the detail has changed, of course. It is neither necessary nor possible to recreate every recess and projection, or to replant every yew and rhododendron – but by following Holford's principles, which have their roots in the picturesque style, it is possible to retain the original historic character of the arboretum. At the same time, new plantings, such as the recent Rotary Glade (2006), are being laid out with an acknowledgement to the original style of planting as employed by Robert Stayner Holford. Though no longer in his family's ownership, but instead managed by a public body, the arboretum at Westonbirt continues to grow and develop for the benefit of a wider audience.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the invaluable assistance from Sally Day during the preparation of this paper.

REFERENCES

[1] Nicholas Pearson Associates, *Westonbirt Arboretum and Gardens. Historic Landscape Survey and Restoration Plan* (October 2003), which includes a full chronology of the development of the Westonbirt landscape. This paper draws heavily on this report and on additional sources that have come to light since.

[2] No doubt lucrative shares in the New River Company, which supplied London with fresh water, enabled George Peter Holford to undertake these improvements. Also Margaret Freeman, *Westonbirt. A Short Account of the Manor and the School* (Westonbirt School, 1956, revd 1965, 1977); and Nicholas Pearson Associates, *Westonbirt Arboretum and Gardens*.

[3] Sophie Piebenga, 'William Sawrey Gilpin (1762–1843): picturesque improver', *Garden History*, 22(2) (1994), pp. 175–96.

[4] William Goldring, 'Westonbirt', *The Garden* (20 February 1886), p. 157. This article is a detailed account of a visit to the estate by William Goldring, one of the magazine's regular contributors. Its tone suggests that Goldring was received by Robert Stayner Holford (then in his late seventies) in person. It provides an excellent insight into Holford's intentions.

[5] Robert Benson (ed.), *The Holford Collection Dorchester House*, 2 vols (Oxford: Oxford University Press, 1928), I, p. xvi.

[6] Albert Bruce Jackson, *Catalogue of the Trees & Shrubs* (Oxford: Oxford University Press, 1927), p. 135.

[7] R. S. Holford's notebook (private collection), p. 17.

[8] John Claudius Loudon, *Arboretum et Fruticetum Britannicum* (London: Longmans, 1838), I, p. xviii.

[9] Nicholas Pearson Associates, *Westonbirt Arboretum and Gardens*.

[10] Michael Symes, 'Westonbirt gardens: a Victorian Elysium', *Garden History*, 18(2) (1990), pp. 155–73. This paper describes in detail the development of the gardens (now owned by Westonbirt School).

[11] Neale's notebook (private collection), compiled in 1858, covers the period *c.*1834–58.

[12] R. S. Holford's notebook (private collection) was started *c.*1860; the last entry appears to be 1891.

[13] Holford recorded, for example, the first 'Deodara' (*Cedrus deodara*) planted in 1837: 'Bought from Knight (£5.5) who bought it for making cuttings, at sale of old Horticultural Society. Planted in Pleasure Ground towards village' (p. 13).

[14] Neale's notebook, p. 52; Westonbirt 1851 census return (National Archives, HO107/1967). Very little is known about Samuel Gray whose work as both a landscape gardener and an artist merits further investigation.

[15] Holford notebook, p. 3.

[16] Ibid., p. 15.

[17] Ibid., p. 29; Holford records in his notebook how this double avenue was later (re?)planted by 'Barron', presumably the William Barron, transplanter of large trees, in 1868 (p. 17). Barron might have planted the inner avenue.

[18] Ibid., pp. 14–15. Wellingtonias were only introduced into this country in 1853 – the trees planted here, therefore, might well be amongst the first to be introduced into the country.

[19] Ibid., p. 17.

[20] Ibid.

[21] Ibid., pp. 33–4, 17.

[22] Ibid., pp. 49–51.

[23] Loudon, *Arboretum et Fruticetum Britannicum*, I, p. 11.

[24] Holford notebook, p. 16.

[25] J., 'Weston Birt', *The Gardeners' Chronicle* (9 July 1881), p. 46. On the other hand, Westonbirt Arboretum was not yet famous enough to be included in the Veitch and Sons's list of recently formed pineta in their *Manual of the Coniferae* (London, 1881).

[26] Goldring, 'Westonbirt', p. 158.

[27] H. J. Wright, 'Westonbirt', *Journal of Horticulture and Cottage Gardener* (2 December 1897), p. 268.

[28] John Harrison Dick, 'Westonbirt House, Tetbury', *Journal of Horticulture and Cottage Garden* (supplement to 10 March 1904), p. 267.

[29] R. S. Holford to Sir J. Hooker (18 November 1883). RBG Kew Library & Archives, DC89, ff.68 [72]. Jackson describes how Lord Ducie had obtained seeds of the Californian Black oak (*Q. kelloggii* 'Newberry') from San Francisco in 1878.

[30] Jackson, *Catalogue of the Trees & Shrubs*, p. 159.

[31] Holford's notebook, p. 12.

[32] Sue Shephard, *Seeds of Fortune. A Gardening Dynasty* (London: Bloomsbury, 2003), p. 202.

[33] Newspaper cutting (28 July 1893), collected by Revd Kitkat (Gloucestershire Archives, P359 IN4/1): 'for years [Mr Holford] maintained at his own expense a professional botanist, commissioned to travel over the four quarters of the globe in search of every rare and curious plant which grows upon its surface, and bring with him, with the specimen, every information concerning its habits, the soil required, the atmosphere most genial to its growth'.

[34] R. S. Holford to Sir J. Hooker (1 January 1883). RBG Kew Library & Archives, DC 89 f.64 [68].

[35] R. S. Holford to Sir J. Hooker (8 January 1883). RBG Kew Library & Archives, DC 89 f.65 [69].

[36] Ibid.

[37] R. S. Holford to Thiselton-Dyer (12 December 1890). RBG Kew Library & Archives, DC 89, ff.71 [75].

[38] Veitch, *Manual of the Coniferae*, pp. 320–1.

[39] Goldring, 'Westonbirt', p. 158.

[40] Ibid., p. 157.

[41] William Sawrey Gilpin, *Practical Hints upon Landscape Gardening* (London, 1832).

[42] Although most of Goldring's article concerns itself with the pleasure ground surrounding the house, his observations on Holford's style also apply to the arboretum; Goldring, 'Westonbirt', p. 158.

[43] Jackson, *Catalogue of the Trees & Shrubs*, p. vi.

[44] Westonbirt visitors' books, 2 (1892–1912) (private collection); Henry John Elwes and Augustine Henry, *The Trees of Great Britain and Ireland* (Edinburgh, 1906–13).

[45] Westonbirt planting notes (1894–1920), Westonbirt Arboretum Archive, A36Man.

[46] Wright, 'Westonbirt', p. 268. Also Clement Godwin, 'Notes on Westonbirt', (*c.*1938), Westonbirt Arboretum Archive, A87Man: '[Sir George] had just received a quantity of seeds, from an expedition he had financed, from Northern India'. Godwin was George Holford's Clerk of Works and subsequently became the first bursar of Westonbirt School.

[47] Various lists of seeds and seedlings, Westonbirt Arboretum Archives, A38Man, A74Man, A75Man, A77Man. Also Westonbirt planting notes (1894–1920), Westonbirt Arboretum Archive, A36Man.

[48] *Country Life*, 21 (22 June 1907), pp. 191–6, quoted in Nicholas Pearson Associates, *Westonbirt Arboretum and Gardens*, p. 47.

[49] Godwin, 'Notes on Westonbirt'.

[50] G. L. Holford to Thiselton-Dyer (21 August 1898). RBG Kew Library & Archives, DC 190, ff.691–2.

[51] *Kew Bulletin* (1947), pp. 63–4. *The Gardeners' Chronicle* (26 January 1924), p. 44. Jackson also worked at Yattenden Court, Borde Hill and Patshull House. He was made an Associate of the Linnean Society in 1917 and received the RHS Veitch Memorial Medal in 1924.

[52] Albert Bruce Jackson and W. Dallimore, *A Handbook of Coniferae* (London: Edward Arnold & Co., 1923).

[53] Entry in Jackson's diary for 11 August 1908. The next day Jackson visited Tortworth, which he described as 'probably the best [collection of trees and shrubs] in the country' (Westonbirt Arboretum Archives, A37Man).

[54] Frederick Robert Stephen Balfour (1873–1945) had planted many new introductions at Dawyck (now partly owned by the Royal Botanic Gardens Edinburgh) since acquiring the property in 1897.

[55] Hunting diaries (1896–1911) describe the various routes taken by the hunt over the estate (private collection).

[56] Godwin, 'Notes on Westonbirt'.

[57] 6th Earl of Morley to Miss E. Yeoman (dated 14 March 1984), Westonbirt Arboretum archives; Westonbirt 1901 census return (Public Record Office, RG13/2445).

[58] *Wiltshire and Gloucestershire Standard* (18 September 1926).

[59] Westonbirt Arboretum Archives, A99Man.

[60] Correspondence from Jackson to Mitchell and Lord Morley (Westonbirt Arboretum Archives, A96Man, A97Man, A99Man).

[61] *The Gardeners' Chronicle* (4 March 1933), p. 152.

[62] 'Westonbirt Record of planting in the Arboretum and Silkwood', 5 vols (1926) I, p. 3. Westonbirt Arboretum.

[63] *Proceedings of the Royal Horticultural Society* (1947), p. xvii.

[64] Saltram was also handed to the Treasury (thence to The National Trust) in lieu of death duties, following the death of the 5th Earl of Morley in 1955.

[65] *Wiltshire Herald and Advertiser* (20 February 1953).

[66] Arthur Hellyer, *Country Life*, 113 (20 March 1953), p. 811. And he warned: 'if the heritage of Westonbirt is neglected one may be sure that both we and our children will be the poorer'.

[67] Forestry Commission files. Also Nicholas Pearson Associates, *Westonbirt Arboretum and Gardens*.

PAUL ELLIOTT, CHARLES WATKINS AND STEPHEN DANIELS

WILLIAM BARRON (1805–91) AND NINETEENTH-CENTURY BRITISH ARBORICULTURE: EVERGREENS IN VICTORIAN INDUSTRIALIZING SOCIETY

William Barron's work at Elvaston Castle, Derbyshire, the seat of the Earls of Harrington, became famous when the gardens were opened to the public during the 1850s. Working with his employers, Barron utilized a variety of landscape gardening techniques including the provision of topiary, rockwork, a lake and hundreds of trees, many of which were transplanted great distances, to transform the grounds into a private chivalric fantasy realm. Subsequently, with the support of the Stanhopes, Barron utilized this knowledge and experience to develop careers as nurseryman, tree transplanter, and landscape gardener receiving multiple private and public commissions including some for major urban parks such as Peel Park, Macclesfield (1854). The paper argues that inspired by his moral and religious convictions, in addition to his horticultural experience, trees, and especially evergreens such as his beloved yew, were central to Barron's career. Although the formal pinetum only occupied part of the grounds, he perceived the whole of Elvaston to be one large pinetum artistically treated, and used the publication of the British Winter Garden *(1852) nursery, transplanting and landscape gardening commissions to further these objectives, especially the promotion of evergreens.*

Although Joseph Paxton is easily the most familiar Victorian landscape gardener, his contemporary William Barron played almost as important a role in forming the image of the landscape gardener as a heroic figure.[1] Like Paxton, Barron trained on private estates and utilized aristocratic patronage, particularly from the Earls of Harrington, to develop a career as a professional landscape gardener using the experience and knowledge that he gained at Elvaston Castle, Derbyshire, their principal seat, during the 1830s and 1840s. Barron employed these ideas and techniques creating multiple urban parks, cemeteries, and green spaces and formed one of the most successful landscape gardening and nursery companies in Victorian Britain. The landscape gardening practices developed and employed at Elvaston, which Barron regarded as 'one vast pinetum, artistically treated', especially the hugely ambitious tree-transplanting, propagating and grafting, transformed a largely featureless site into one of the most celebrated gardens in Europe and North America.[2] Hundreds of trees, including very large and mature specimens, were moved across Derbyshire and adjacent counties, whilst the grounds, and especially the pinetum and Barron's 'British Winter Garden', promoted the use of evergreens in public and private spaces, helping to drive the new fashion in British, European and American gardens. Barron came to be regarded as one of the leading British arboricultural experts, and this paper examines how he utilized trees in his landscape gardening, nursery and transplanting businesses.

School of Geography, University of Nottingham, University Park, Nottingham NG7 2RD, UK

Like Paxton, Barron applied the knowledge, experiences, and working practices of private aristocratic estates to develop landscape gardening and arboriculture for a modern urban industrial society. The company he established undertook hundreds of gardening and transplanting commissions throughout Britain and Europe. Although tree-transplanting became increasingly popular during the late eighteenth century, by adopting and promoting novel methods, personally overseeing the process and publicizing his removal of famous trees, Barron was the first to make a business from moving trees on an industrial scale. There were few limits to his transplanting ambitions and he moved thousands of specimens, some of great antiquity, creating the arboricultural equivalent of engineers such as the Stephensons and Brunel. Barron also encouraged a change in the way that gardeners and nurserymen propagated and maintained tree and shrub specimens. Urban parks, gardens, cemeteries and other green spaces were rapidly transformed into apparently mature creations, a process that would previously have required decades of growth and management. Consulted by Parliament, Barron also helped to establish forestry and arboriculture as professions in their own right in Victorian society.

EVERGREENS IN BRITISH ARBORICULTURE AND LANDSCAPE GARDENING

Barron was attracted to *Coniferae* because of their cultural associations and natural characteristics, which he was able to exploit for economic and moral purposes. In turn, Barron and his company helped to foster the mid-Victorian fashion for evergreen planting, promoting them for their economic value and as special and ornamental specimens. The evergreen that became most closely associated with Barron was the yew and the cultural associations and ornamental value of the yew, as well as the relative ease with which it could be moved, attracted him to favour it for many landscape gardening and transplanting commissions.

Practical uses in medieval society, especially as a material for the construction of bows, and the sacred symbolic value of yews, customarily planted in churchyards, ensured that many celebrated examples existed by the eighteenth century. As the Manchester naturalist John Bowman put it in the *Magazine of Natural History*, 'it seems most natural and simple to believe that' from the 'perennial verdure', longevity, and the durability of yew wood, it had been 'at once an emblem and a specimen of immortality' used by 'our Pagan ancestors' to adorn graves and for other sacred purposes. The practice was continued into the Christian era and yews became associated with ghosts and fairies. In early Christian society churches became associated with old and striking yew trees and it was believed that yews were vestiges of ancient druidical groves and were 'already sacred, venerable for size and indispensable for religious rites'.[3] The longevity and sacred cultural associations of yews were celebrated by John Claudius Loudon in a lengthy analysis in the *Arboretum et Fruticetum* and in the romantic poetry of Sir Walter Scott, Robert Blair and William Wordsworth, much of which saw the tree as gloomy but magical and spiritual. For Blair, the Yew was a 'cheerless unsocial plant, that loves to dwell midst skulls and coffins, epitaphs and worms', whilst Scott described 'a dismal grove of sable yew, with whose sad tints were mingled seen, the blighted fir's sepulchral green'. Whilst the yew retained its sorrowful associations for Wordsworth, its longevity and appearance were to be celebrated. The yew tree of Lorton Vale was 'of vast circumference and gloom profound … a living thing, produced too slowly ever to decay', whilst four other yews of Borrowdale were to be celebrated for their 'solemn and capatious grove' of 'huge trunks' and 'intertwisted fibres serpentine', where 'ghostly shapes' might meet 'as in a natural temple' to worship.[4]

Whilst appealing to gothic and romantic sensibilities, such associations prevented the yew, like other evergreens, from enjoying general popularity in Georgian landscape gardening, and it is telling that when Humphry Repton wanted to depict an over-improved estate boundary, he chose to highlight the replacement of native deciduous trees with belts of alien coniferous imports.[5] However, the rapid importation of new coniferous species and their rate of maturation helped to encourage change. Many new varieties were first detailed in successive editions of Aylmer Bourke Lambert's *Description of the Genus Pinus* (London, 1803) which, along with the introduction of new conifers onto estates such as Painshill and Woburn, increased their popularity. It has been claimed that Linnaeus, for example, thought that there was 'a greater variety of the fir' to be found at Painshill 'than in any other part of the world', whilst Lambert thought Charles Hamilton's estate at Painshill, which helped to inspire his book, to be 'the most remarkable gardens for the cultivation of pines in this country' and superior to anything in Europe.[6]

Clipped yews, as hedges or garden ornaments, had been fashionable during the seventeenth century but this declined rapidly during the eighteenth century apart from a few places such as the gardens at Oxford and Wroxton. There was, however, some resistance to the idea that yews were merely miserable and solemn trees, which must have encouraged Barron to reinstate topiary and give prominence to evergreens. The artist and writer William Gilpin professed himself 'contrary … to general opinion', an admirer of the 'picturesque perfections' and 'form and foliage' of the yew, although he condemned the 'indignities' of clipping under which it suffered. In a 'state of nature', the yew was one of the 'most beautiful evergreens we have', possibly even superior to the Cedar of Lebanon as it had been grown in England. It grew well on most soils, yet was seldom visible in its natural state. Gilpin admitted, however, that 'though we should be able to establish the beauty' of yews 'with respect to form and foliage', it was difficult to combat the view that 'its colour, unfortunately, gives offence'. It was considered that its 'dingy funereal hue' made it fit only for churchyards, but this attachment to colour was 'an indication of false taste', through which rose the 'numerous absurdities of gaudy decoration', whilst dislike towards particular colours revealed a squeamishness that, he considered, should be little encouraged. Colours needed to 'act in concert' so that soft and pleasant hues were combined with reds, blue, yellow, light green and dingy green, their virtue consisting 'solely in [their] agreement with [their] neighbours'.[7]

Loudon, too, emphasized the beauty and longevity of the yew, and argued that the neglect of evergreens in landscape gardening and horticulture was unjustified. He provided illustrated accounts of the most celebrated British yews, including those at Fountains Abbey, Yorkshire; Buckland, Kent; Tytherley, Wiltshire; Tisbury, Dorset; and Iffley, near Oxford. As an avenue tree, the yew was 'suitable for approaches to cemeteries, mausoleums, or tombs', whilst single specimens could be scattered in churchyards and burial-grounds; so the yew was valuable singly or as undergrowth and clumps in the right context.[8]

ELVASTON CASTLE

Before coming to Elvaston in 1830, Barron had received a good education in his native Scotland and, aged fifteen, had become apprentice gardener at the Blackadder estate in Berwickshire. Three years later he moved to the Edinburgh Botanical Gardens under Robert Graham (1786–1845), Regius Keeper and Professor of Medicine and Botany at Edinburgh University, and William McNab (1780–1848), head gardener and curator, attending lectures on botany, chemistry, mechanics and natural philosophy. In 1827, Barron was employed by the Duke of Northumberland at Syon House, Middlesex, where he helped to plant the new conservatory, but it was through the recommendation

of McNab that he was chosen by Charles Stanhope, 4th Earl of Harrington, for the position of head gardener at Elvaston. Barron's Scottish background, general education and experience was an important factor in his success and, like Loudon's career, reflected the quality of Scottish education and attention to improvements in horticulture and agriculture of the Scottish Enlightenment.

Under Graham and McNab during the 1820s and 1830s, the Botanical Gardens were at the centre of international plant gathering networks and the importation of new species, which were accommodated in a new site at Inverleith with extensive hot houses placed under Barron's direction. McNab, who had been gardener at the Royal Botanical Gardens, Kew (1801–10), and collected an extensive herbarium, was then regarded as 'the greatest practical gardener in Europe', whilst his son, James McNab (1810–78), who succeeded him as curator at Edinburgh, plant hunted in North America.[9]

Over two decades from 1830 at Elvaston Barron drained, landscaped, planted and turned the flat, muddy, marshy and unpromising grounds into a gothic fantasy park to serve as counterpart to the redeveloped gothic mansion (Figure 1). By 1850, the park featured thousands of trees, a large lake surrounded by elaborate mounds, trenches and ridges, rocks shaped into fantastic shapes, and more formal geometric gardens dominated by masses of topiary, also moulded into wonderful shapes, towards the house (Plate X). The gardens were created for Stanhope and his wife Maria, whom he had married in 1831. Close to the Prince of Wales, as Viscount 'Beau' Petersham until 1829, the Earl became famous as a Regency dandy with a fondness for extravagant and exaggerated fashions, romantic gestures and the theatre. However, he also had a significant military career, rising to the rank of colonel by 1814. Maria Foote was acclaimed for her beauty and talent as an actress, playing at Covent Garden and touring Britain in various productions until 1831.[10] As well as being an important retreat from the gossip of society,

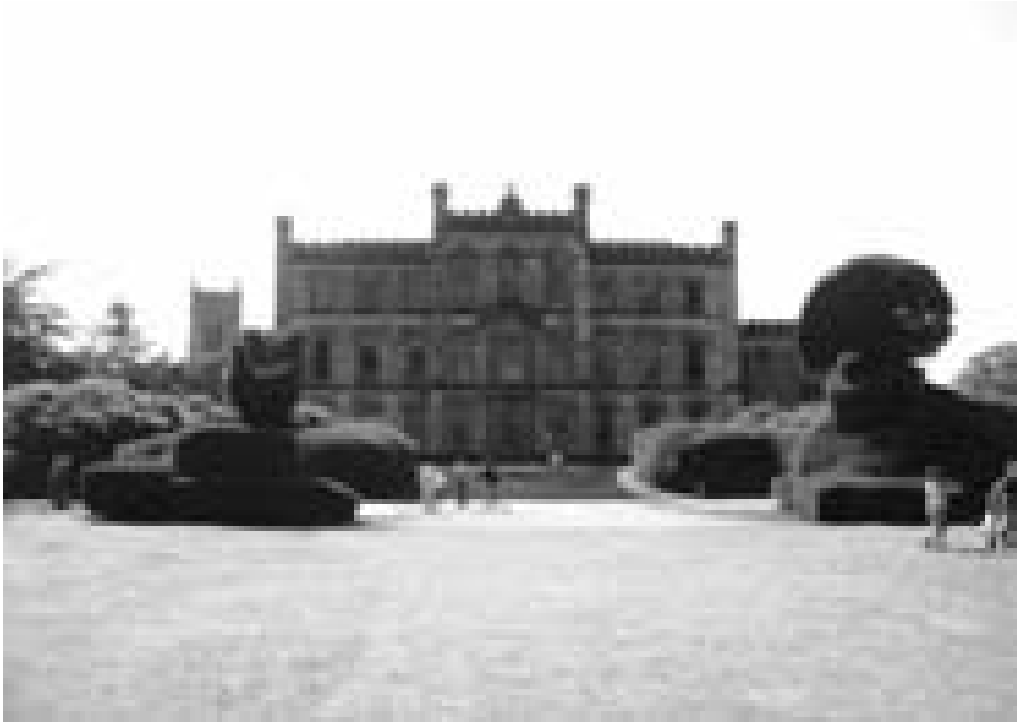

Figure 1. Elvaston Castle, Derbyshire. Photos: all Paul Elliott

the transformation of Elvaston offered the opportunity for the lovers to create a private theatrical fantasy world, a new stage upon which to perform.[11] Loudon and his wife Jane visited in 1839 when work was still under way and were highly impressed with the formal gardens, the house and Barron's arboriculture, which they featured in a report in the *Gardener's Magazine*, although Loudon did suggest that they should be opened to the public when they had reached maturity.[12]

Under the 3rd Earl, major changes to the castle were undertaken by James Wyatt and Robert Walker, although parts of the earlier manor house were retained. The 4th Earl had the east wing rebuilt and interiors refurbished in the gothic style under Lewis Cottingham. The entrance hall became the 'hall of the fair star' and the castle was decorated with symbols of medieval chivalrous love and ideals with lances and swords, suits of armour, gold, black, and scarlet paint everywhere with mottoes and shields. These themes were continued under Barron's direction in the formal architectural gardens south of the Castle, based upon miles of closely clipped, evergreen hedges transformed into fabulous shapes, also intended to celebrate the ideals of knightly chivalry. The Alhambra garden featured a Moorish temple with a statue of the Earl and Countess, Charles kneeling at Maria's feet. The Mon Plaisir garden, also known as the garden of the fair star, was the most celebrated and featured elaborate topiary and statues inspired by seventeenth-century designs. The centre consisted of a monkey puzzle tree, the tallest and probably the most expensive at Elvaston, surrounded by an eight-pointed, star-shaped bed planted with golden holly with yews clipped in architectural shapes to form bowers for statues. Surrounding the star were eight bowers of *Arbor vitae* panelled with *Cydonia japonica* which held semicircular seats. The garden was enclosed by walls of yew and within these was a tunnel of *Arbor vitae*, which offered shade and views of other parts of the garden through cut windows. Finally, the adjacent Italian Garden, based upon Tuscan designs, was also enclosed by tall yew hedges inside which were twenty tall marble statues; according to Loudon it was 'richly furnished with vases, statues (many of which are in grotesque forms), richly gilt, basins, fountains and other works of art'.[13]

Almost equally celebrated were the avenues, lake, elaborate rockwork and pinetum which were expressly designed to frame particular pictures from different parts of the garden and especially from the windows of the castle. The completely artificial, yet naturalistic and picturesque, lake was formed by 1830 and surrounded, especially on the north side opposite the castle, by equally artificial rockwork featuring caves, grottoes and mounds. The rocks were moulded into fantastic shapes, including small caves and arches and covered with Alpine plants, whilst some of the mounds created from the earth excavated when digging the lake were 50 feet tall (Figure 2 and Plate XI). Barron created and augmented various avenues, the most spectacular being the grand east wing avenue, which followed a line already developed from the Castle, extended to provide uninterrupted views of ten miles distance towards the Gotham Hills by removing intervening trees, thus serving to appropriate surrounding lands into the estate (Figure 3). At either side of smooth turf were circular flowerbeds and a line of Irish yews following a wavy pattern around. The trees were planted in straight lines, three rows deep, using twelve different species, with particularly striking *Picea nobilis*, and inspired the development of evergreen plantations and avenues on other estates.[14]

A 16-acre grassed field was set aside for a special pinetum, although, as we have seen, Barron regarded the entire gardens as one large picturesque pinetum (Plate XIII).[15] This was planted exclusively with evergreens from 1835 around what had formerly been the central drive, the eastern side with *Pinus* specimens and the west with *Abies* and *Piceas*. Stock was obtained economically using Barron's evolving methods of

Figure 2. Rockwork and planting, and yews and rocks beside the lake at Elvaston Castle, Derbyshire

Figure 3. The great east wing avenue at Elvaston Castle, Derbyshire

transplantation, from nurseries and through propagation of cuttings, partly because, as Barron emphasized, the Earl had never been a member of the Horticultural Society and could not easily obtain trees at first hand. As it was often possible only to obtain single or small numbers of rare trees, propagation and grafting provided an opportunity to enhance the collection without large expenditure.

At the centre of each of the two sections were straight turf avenues planted with Irish yews at the front, backed by golden yews opposite the openings. The next line was *Araucaria imbricata* and then behind these two rows of deodars which were grafted onto the Cedar of Lebanon. The northern and southern ends of the avenues were planted with *Cedrus deodara* and *Cedrus libani* and at the other end *Taxacea* and *Cupressinae*, and Loudon was astonished at the quantity of *Thuyas*, red cedars, white cedars, hemlock spruces, and variegated and common yews. The plan of the pinetum at Elvaston, therefore, combined attention to symmetry, space, and geometry with aesthetics and taxonomy, although there is no mention of labelling in the sources, presumably because, as a private pleasure ground and given Barron and his gardeners' expertise, it was not considered necessary. For Glendinning, 'if any artificial assemblage of trees can reach the sublime in gardening', then the Elvaston pinetum was such an example and it was 'difficult, nay impossible to convey any adequate idea of the impression' produced by such a 'noble plantation'. The pinetum contained almost every variety of coniferous plant 'known or obtainable in European gardens', some of the 'most rare and valuable kinds', in such a quantity and size never before established.[16]

The gardens were opened to the public by the 5th Earl in 1852 after the death of his brother, attracting considerable interest, although at a cost of 3*s*. for admittance they remained the preserve of elite visitors.[17] According to the *Gardener's and Farmer's Journal* (1852), Elvaston was without exception 'first for its great accumulation of rare evergreen trees and shrubs' and for the 'effect which are by means of these trees produced, that is, in the grouping and mixing trees according to … habits of growth, their various heights, but, above all, their colours', producing effects 'such as are nowhere else to be seen'. It was remarkable that yew trees had been collected from across the nation some of which were 'several hundred years old' and consisted of 'a mere outer shell, the whole of the centre being decayed and gone'. Yet these old yews were now 'thriving and growing with as much vigor as if they had been raised from the seed bed but ten years ago'. Likewise, Glendinning lavished praise on Barron's achievement. Looking across the lake from an elevated position amongst 'enormous columnar rocks' from a seat, he found that the view almost baffled description. 'An immense expanse of water, swarming with water fowl' was exposed, whilst 'the bold sinuosities of the margin, with an inconceivable amount of artificial rock naturally disposed', was 'planted with thousands of the most valuable plants'.[18]

The Elvaston gardens and pinetum demonstrated the possibilities of colour and shape throughout the year, helping to make evergreens and topiary the height of fashion in Britain, Europe and North America. Barron undertook numerous private commissions between the 1850s and 1880s, many of which featured extensive arboricultural work. At Sennowe Hall, Norfolk, between 1858 and 1865, for instance, he managed the estate in Chancery for the trustees of Morse Boycott and, employing a Scottish woodsman and labourers, formed an entrance drive, similar to Elvaston, with rows of cedars and Douglas firs.[19] One of the gardens inspired by Elvaston was Biddulph Grange, Staffordshire, where many evergreens were planted in a pinetum amongst the spectacular rockwork, many on mounds, golden yew hedges were formed, and a multilayered avenue formed by the owner James Bateman and the landscape gardener and painter Edward Cooke during the 1840s and 1850s.[20]

As part of his enquiry into public parks for the New York commissioners, Frederick Law Olmsted toured Elvaston and Biddulph Grange in 1859, having been recommended to see them as exhibiting 'the art of landscape gardening in higher perfection than any other in England'. At this time Olmsted was engaged with the New York nurseryman Samuel Parsons (1819–1906) in selecting a 'valuable collection of trees and shrubs' from Britain to be shipped for Central Park in the spring. He was 'greatly delighted … especially at Elvaston' and commented to Sir William Hooker that they were the 'most interesting collection of evergreens, arranged in a striking and beautiful manner' and the finest such plantation in Europe. Only with changes in gardening fashion did Elvaston lose its lustre. Although William Robinson shared Barron's love of yews as 'the most beautiful evergreen of our western world', he criticized the 'baneful' large scale planting of foreign trees and relative neglect of 'noble native evergreens' in British gardens and excessive architectural inspiration. Echoing Gilpin, the clipped 'disfigurement' of topiary and the '"showy" labeling method of the pinetum' such as at Elvaston, came in for criticism as 'not necessary in any good way of planting'.[21]

Barron's arboricultural expertise was recognized by the select committee on forestry established in 1885 to investigate the establishment of a British forestry school, who questioned him as their first witness in 1887. Emphasizing his experience of managing the estates at Gawsworth, Elvaston and Sennowe, Barron argued that too much 'rubbish' was being planted around the country and that if the right kinds of trees were selected and grown correctly then British forestry could compete commercially with foreign imports to supply timber for important industries such as the railways. He recommended that the establishment of a forestry school would be an effective way of educating a generation of foresters in botany and practical arboriculture who could teach the next generation on estates. Barron provided a list of recommended trees for planting around Britain, although not until they were at least 4 or 5 feet tall, especially favourite coniferous varieties, including the Corsican pine, Austrian pine, Douglas fir and Oregon fir, recommending that permanent forests needed to be divided by intermediate spaces for hardwood, game and in order to facilitate access to the timber to be harvested.[22]

THE NURSERY BUSINESS

After the death of his brother, Leicester Stanhope, the 5th Earl of Harrington radically changed the management of his estates in Derbyshire, Cheshire and elsewhere. This was partly for financial reasons, but was also driven by the Earl's political views and paternalistic social intervention. He encouraged Barron to undertake various public social and political activities on his behalf. Like his father, brother and grandfather, Stanhope served in the army rising to the rank of colonel, much of this being in the colonies, especially India, where he served as Quartermaster General between 1817 and 1821. Close to Jeremy Bentham, who regarded him as his 'dearest friend' and entrusted him with the manuscript of his *Constitutional Code*, Stanhope was a significant political figure who campaigned for reforms of the military, Catholic emancipation, reform of the East India Company, freedom of the Indian press, and Greek independence. Fostered by the Orientalists and Utilitarians who influenced the governance of the East India Company and British Enlightenment perceptions of India, Stanhope combined respect for Indian language, tradition and culture with a paternalistic imperial determination to reform along British Whig constitutional lines. As agent of the London Committee in Greece, Stanhope met Byron, and tried to encourage the Greek leaders to establish a constitutional state similar to that advanced by the Benthamites for India with hospitals, a system of schooling, philosophical institutions and a free press. However, despite

offering advice on military strategy and organizing various newspapers, he fell out with Byron, other members of the London committee and some of the Greek leaders, and left for England encouraged by Canning in 1824 with Byron's body.[23]

Although less active in national and international politics subsequently, the death of his brother and inheritance of the family estates and London residence at Harrington House, Kensington Palace Gardens, provided Stanhope with an opportunity to utilize wealth and property to further liberal objectives. In November 1852, he recounted his friendship with Bentham and support for 'gradual and reformatory' political change and the 'abolition of abuses' in a speech at a special dinner for Elvaston tenants, whilst warning of 'dangerous, hasty innovations, which retard the march of sound reform'.[24] Citing the example of his Indian and colonial experiences, Stanhope enacted major improvements on the family estates where the emphasis changed from private pleasure grounds to public parks and working estates.

Major sales of timber at Elvaston coincided with the foundation of an industrial school for the villagers and extensive engineering improvements at Gawsworth, whilst the churches there and at Elvaston were extensively rebuilt. The Earl also provided a hot bath 'for nothing tends to health and moral conduct than cleanliness', a school garden 'in order to teach the children how to manage their cottage gardens and allotments' and the 'rudiments of agriculture'.[25] The sales of timber included 1743 numbered and still-standing oak, ash, elm and sycamore 'of immense size and splendid quality', and 516 poles, the lots to be auctioned commencing at Alvaston and running right and left of the London Road within a mile of Shardlow canal wharf, from where the timber was transported. However, Barron later said that these timber sales had not been a commercial success owing to mismanagement of the woods before 1850.[26]

After the death of the 4th Earl and the public opening of Elvaston, Barron was encouraged to develop the commercial potential of the nurseries. In 1862 after the death of the 5th Earl, he purchased 40 acres in Borrowash near Derby from the Stanhopes for a nursery and moved there three years later, resigning his position as head gardener at Elvaston. Traces of the nursery survive at Borrowash, including Barron's house complete with large bay window specially constructed to allow the widest possible views of the gardens (Plate XII and Figure 4). Barron claimed that his nursery had purchased 'every new plant introduced into this country' over the previous two decades. The company had agents in various countries abroad from whom consignments of seeds were received of varieties best reproduced in that manner. The nurseries specialized in *Coniferae*, but offered all manner of other trees, shrubs and plants, deciduous, ornamental and flowering, American plants such as *Rhododendrons*, roses, stove and greenhouse plants, and fruit trees. Editions of the printed catalogues claimed that through these means their stock of *Coniferae* was 'celebrated both at home and abroad as being perhaps the best in the trade'.

Between 1868 and 1874, the firm had 'constantly exhibited at all the principal shows in the United Kingdom, and have as yet invariably obtained first honours' (Figure 5). Barron built upon this expertise to enhance his knowledge and stock of ornamental deciduous trees and by the 1870s was giving 'special attention to this branch'. The company developed important international contacts and secured commissions in Europe and elsewhere. Several young men from Germany, France and the Netherlands were employed, whilst Barron's son was educated under Prince Herman Puckler-Muskau (1785–1871) and Eduard Petzold at Muskau in Silesia and in the Netherlands. This cooperation between two of the leading European landscape gardeners and arboriculturists continued as Barron's grandson attended a government school in Potsdam, whilst Petzold's son

Figure 4. Rear of William Barron's house at Borrowash, near Derby

worked at the Borrowash nursery for three years. Petzold was director of gardening at Muskau between 1852 and 1881, author of many textbooks on landscape gardening, horticulture and arboriculture, including *Arboretum Muskaviense* (Gotha, 1864), and designer of numerous European public parks.[27]

The decades at Elvaston allowed Barron to experiment with different varieties of trees and shrubs and he was able to capitalize on this experience and connections made working for the Stanhopes, a link symbolized by the view of tall trees in the park from the nursery gardens. Barron was also able to respond to problems noticed even by proponents of evergreen such as Gilpin, that they provided insufficient variety of colour. Like other major Victorian nursery companies, Barron's success partly depended upon the relationship maintained with other landscape gardeners, journalists, collectors and botanical writers which, in turn, required the cooperation of nurserymen and their network of contacts and agents. Such a relationship is evident from the role of nurserymen such as Loddiges of Hackney in Loudon's work and also the assistance provided by Barron to George Gordon in the production of his *Pinetum*.

The most famous varieties developed at Elvaston, promoted by Barron and associated with his nursery included the *Taxus elvastonensis aurea* (*Taxus baccata elvastonesis*) or golden Elvaston yew, a type that was 'a bright orange colour, and unlike all other golden or silver yews, is not variegated but a self colour; it is by far the most brilliant of any in winter'. This was described in Gordon's *Pinetum* as 'by far the most brilliant of any of the golden varieties in the winter time'. Other striking varieties of yews in which the company specialized were the *Taxus variegata aurea* (*Taxus baccata variegata baronni* or Barron's variegated yew). It was claimed that 'the magical effect produced by this lovely plant in landscape gardening must be seen to be understood', whilst the nursery had 'the largest stock … in existence, all trained as pyramids'. A female variety raised at Elvaston

Figure 5. William Barron, *Select Catalogue of Coniferae and other Ornamental Plants … Offered for Sale by William Barron and Son* (London and Derby: William Bemrose & Sons, 1875), pp. 8–9

from a seed of the old golden yew was described by Gordon as a 'very symmetrical' shrub that formed 'a perfect pyramid', grew more freely, had a brighter colour and, being a fruit bearing variety, was 'very desirable'. The company also tried to obtain and develop the latest varieties introduced by rival nurseries. Barron successfully developed and marketed a 'remarkably fine' variety of *Cupressus lawsoniana elegantissmia* or very elegant Lawson's Cyprus, which had 'not only the young leaves, but the young wood of a beautiful canary colour diffused over all the branchlets, the colour not being impaired, either by the sun's rays in summer, or the frost in Winter'. Likewise with respect to the *Retinospora tetragona* or 'sure-branchletted Japan Cyprus', a dwarf compact slow-growing shrub of a remarkably bright green colour, Gordon reported that Barron had recently obtained from Japan 'a nice variegated form with a portion of the lesser branchlets of a rich golden colour'.[28]

Nursery firms such as Barron and Company were under considerable commercial pressure to obtain, produce or 'discover' novel varieties, and this impacted on the way that specimens were managed. It was clearly in the interest of nurserymen to sell as many unusual varieties as possible and support the activities of plant collectors and explorers. However, this meant that many species unsuited to the British climate were introduced and quickly died without the necessary expertise, climate, soil and other conditions necessary for their growth. In his *British Winter Garden*, Barron complained about the tendency of nurserymen to keep specimens in pots which, in his view, inflicted so much damage on the roots that trees never recovered even after being planted for

decades.[29] Furthermore, although some nursery companies such as Loddiges developed famous complexes of gardens, glass houses and arboretums as display for pleasure was not the primary purpose, specimens were sold off, cut back or removed once they had grown to a certain size, destroying rather than preserving collections. Just after Loudon had obtained sketches of all their plants, in 1832 and 1833 Loddiges had most of their timber trees removed, because they had reached a stage of development where they were crowding out other plants. Stools and young plants remained for propagation of the next generation of plants, but Loudon called this an 'incalculable loss' of 'a collection of specimens such as could be found assembled together nowhere else in the world', as it had prevented him from viewing many trees when in flower.[30] Although Barron learnt much from his Elvaston experiences, there were important differences between private estate and commercial nursery practices. Estate gardeners could nurture valued specimens over decades whilst commercial nurserymen had to be concerned with the profitable display and sale of trees and shrubs.

TREE TRANSPLANTING

The degree of expertise that Barron was able to acquire in tree transplanting meant that it became a major part of his business, enabling him to achieve almost immediate effects with mature and established trees in what would previously have taken decades or centuries, providing instant satisfaction and much wider possible configurations for owners and gardeners. Transplanted trees stood as testaments to the 'employment of skill and expense' by owners and park promoters. Loudon argued that landscape gardening was 'greatly inferior in beauty to the imitative creation of a painter from the same groundwork and materials' and that 'no comparison between the powers of landscape-painting and those of landscape gardening can be instituted, that will not evince the superior powers of the former art'. This was primarily because wood provided the great source of beauty in every landscape and this depended upon 'accidental circumstances' in the progress of trees from planting until maturity, which could not 'be said practically to be under the control of the gardener'. However high the aim of gardeners, however much the 'natural effects of time' were studied, and 'however correctly we may imitate them', at the end of all work, 'any wood of art will always be far inferior to a wood of nature under the same circumstances'. For Loudon, landscape gardening was therefore limited to 'picturesque beauty' and the production of a harmonious and agreeable 'assemblage of objects'. Large-scale tree transplanting, however, offered greater opportunity for landscape gardeners to aspire to the higher beauty of the artist in their response to nature by simulating and appropriating the 'natural effects of time'.[31]

Although tree transplanting was not new, it was undertaken on a much greater scale using novel techniques and equipment from the 1820s and 1830s, which had a major impact upon Victorian arboriculture and horticulture.[32] Sir Henry Steuart used a technique in which trees were placed into holes with bare roots, whilst others, including Loudon, recommended that balls of earth should be allowed to remain around the roots in some circumstances. The technology employed by Barron and the scale and success of his transplanting work was unprecedented, providing instant arboriculture for private gardens and public places commensurate with the ambitions of the aristocracy and middle class industrial society. From the beginning, Barron made use of the railways to transport trees, the parts of his machines and his specially trained workforce – which invariably were sold as a package – around the country (Figure 6). He became adept at publicizing his transplanting methods and the movement of large and old trees through the streets was much photographed and reported in newspapers, such as the transplanting of the

Figure 6. William Barron's transplanting machine; from William Barron, *Select Catalogue of Coniferae and other Ornamental Plants ... Offered for Sale by William Barron and Son* (London and Derby: William Bemrose & Sons, 1875)

Buckland Yew in 1880, a tree celebrated by Loudon with a documented age of eight hundred years.[33]

The first of Barron's tree-transplanting machines was invented in February 1831, and in November, a 43-foot tall and 48-foot diameter Cedar of Lebanon was moved into the gardens at Elvaston; it had grown by the 1870s from a trunk of 2 feet in circumference to one of 10 feet. Another tree 72 feet high was moved more than two miles in an upright position and yews from six hundred to eight hundred years old, oaks and larches from

40 to 50 feet high, and large spruce and silver firs, even in the middle of summer, were moved, so it was claimed 'without losing a leaf'. The method worked by preparing the tree for two or three seasons by digging around to cut the spreading roots and by filling this with fresh soil. The transplanter was then assembled around the tree and the exposed ball of roots and soil was wrapped and tied before being winched up to the transporter.[34] By the 1870s, machines had been constructed for the Duke of Portland, the Duke of Manchester, and other of the gentry and nobility, and the Royal Botanic Gardens at Kew. The latter was purchased in 1866 and became known as 'the Devil' by gardening staff who, one winter, moved sixty trees from between 2 and 7 tons. Commissions were obtained from throughout Britain and abroad and machines supplied to aristocracy, gentry and other private clients, institutions, and urban government authorities. By the early twentieth century machines had been supplied to international clients including the City of Freiburg, the Grand Duchy of Baden, the International Exhibition at Kingston (Jamaica), the Indian army, and the Maharajah of Bharatphur. Others also adopted Barron's methods with considerable success, including the Scottish landscape gardener William Tillery at Welbeck Abbey, Nottinghamshire, for the Duke of Portland.[35]

Testimonials appeared in editions of Barron's catalogues illustrating the geographical and social spread of the market. John Fordyce, for instance, agent to the Duke of Manchester stated that with one of Barron's large machines they had transported over one hundred and thirty trees of forty years growth, including Spanish chestnuts, limes, sycamores, and oaks with balls varying from 3 to 8 tons with complete success. According to Childe Pemberton of Thornhill, Cowes on the Isle of Wight, such operations had enjoyed 'great success' when conducted between 1858 and 1861, when a large number of trees of all shapes and sizes were moved at all times of the year 'a good many of these being yews of large size and of great age'. Similarly, Lt-Col Edward Lloyd of Lillesden, Kent, praised the 'perfect efficiency' of Barron's machines and 'the intelligence and zeal of the men you send with them'. Hundreds of large trees had been moved, which had increased the beauty of his park when it would have taken a century using normal methods to arrive at this state.[36]

Of course, such statements were deliberately selected by Barron to reflect well on his company and methods and we seldom hear if anger or hostility resulted from old trees being moved from one location to adorn private parks. Although this form of collecting, as Barron emphasized, could be used to moved great and beautiful trees to more suitable sites or prevent them from being spoiled by other trees and buildings, tree transplanting was an aggressive and imperious act that involved denuding other places sometimes of very old and loved specimens. At Elvaston, for example, trees were taken from places where they had stood for centuries for the private pleasure of one couple. Barron provides very little information concerning the source of these trees and seems to have been unconcerned with the effects of denuding places of well-established specimens. In this respect there are strong parallels between tree transplanting and the exploitation of British and colonial labour and natural resources by Victorian industry. Tellingly, criticism concerned the degree of artificiality inherent in forming pinetums such as that at Elvaston rather than the question of exploitation.[37]

Barron acknowledged that there was some hostility towards the degree of unnaturalness and artificiality employed at Elvaston, especially the large-scale transplanting, clipping and shaping of trees and shrubs, the architectural qualities of the design and arrangement of the rocks. He was aware that 'certain prejudices exist against any liberties being taken to alter the natural growth of trees' and the arguments that coniferous or resinous trees could not be cut or pruned without risk of serious

injury. However, he thought that Elvaston demonstrated how well 'nearly every kind of coniferous tree will yield to art, at the discretion of the operator' and so long as the rules of nature were 'properly attended to'. It was natural to object to something initially new and seemingly at variance with common custom, however, just as beautifully trained fruit trees were now accepted and commonplace, so it could not be reasonable to 'object to art being applied to alter the forms and habits of ornamental trees in the garden or landscape to suit styles of artistic gardening'. Likewise, although his rockwork did not satisfy later standards of naturalism which emphasized credibility through congruity and stratigraphic realism, they were acceptable to the standards of naturalism prevalent between the 1830s and 1850s with consistency and size of stones and natural scale. Elvaston demonstrated for Barron how 'nature and art' could 'harmonise and co-operate' so long as the rules of nature were properly followed.[38]

TREES IN TOWNS: BARRON AND COMPANY AND URBAN ARBORICULTURE

Although Barron came to private professional landscape gardening relatively late compared to Paxton, he was encouraged by the 5th Earl of Harrington to undertake designs for commissions for public green spaces, such as parks and cemeteries, from the 1850s, as well as private gardens and tree-transplanting commissions. Beginning with a small number of commissions, by the 1880s Barron and his company had undertaken scores of major projects for public parks and cemeteries, including Peel Park (Macclesfield), Worcester Arboretum Gardens, Locke Park (Barnsley), Abbey Park (Leicester), Belper River Gardens, the People's Park (Grimsby), Belper Cemetery and Nottingham Road Cemetery (Derby). These projects enabled Barron to further moral and religious objectives and to promote the use of evergreens in a large variety of urban settings.[39]

In these designs, Barron was able to exploit knowledge of arboriculture and experience of formal and geometric gardening gained at Elvaston, in addition to picturesque techniques. At Abbey Park, for example, between 1877 and 1882, Barron followed an elaborate plan on the slopes of a hill featuring picturesque planting around a series of curved walks and geometric beds that, nevertheless, conformed to a basic symmetry and provided spaces for public games. At the Worcester Pleasure Gardens (later Worcester Arboretum), Barron's design featured a similar combination of picturesque planting, especially round the perimeter, with broderie parterres surrounded by serpentine walks, terraces, promenades, flowerbeds, a bowling green and other sporting features, enclosed in elaborate iron gates and ornamental palisading.[40] Barron's moral and religious beliefs and expertise with coniferous trees and shrubs meant that he was ideally suited to cemetery commissions, given the importance of evergreens in Victorian culture as symbols of piety and eternity and the association of yews with sacred places. At Belper, for instance, Barron collaborated with Edward Holmes, a Birmingham architect, on a 15-acre site at the instigation of the local burial board. Holmes designed a lodge and twin mortuary chapels connected by a square tower and spire whilst Barron advised on laying out the plots, draining the land, positioning the roads and planting.[41]

Although it has been largely ignored in the history of parks and gardens, Peel Park, Macclesfield (1854) (renamed West Park in 1904), is significant as the first sole public park commission undertaken by Barron and, as the first such design after the completion of Elvaston and the publication of the *British Winter Garden*, demonstrates the importance he placed upon arboriculture in public places. Like Elvaston and some of his other parks commissions, although not officially designated as arboretums, Barron regarded these places as large pinetums, 'artistically treated'. The campaign for a public park in Macclesfield was inspired by the example of similar ventures in Manchester,

Derby and other towns. It was relatively unusual, in that although some local aristocrats, such as the Earl of Harrington, supported the venture, much of the early agitation was by working class leaders, such as Joseph Edwards and the Irish Chartist, John West. However, when an initially successful campaign organized by Chartists, trades unionists and benefit societies that mobilized thousands and raised hundreds stuttered in the face of economic recession, Stanhope and some middle-class leaders and gentry, especially John May, a local lawyer and social campaigner, provided renewed impetus. Barron was called in by the Earl to employ some of the techniques that he had developed at Elvaston for the public good and the project offered the Earl an opportunity to respond to criticisms made of his brother that he had been selfish in creating an exclusive private pleasure ground with little benefit to the community. Although the focus of the local elite quickly turned to the foundation of a town museum, working-class involvement created a strong communal bond with the park. It ensured that it would be a success, despite the introduction of charges, and influenced the terms of the design and management, in contrast to the working-class suspicion that had initially greeted Manchester park promoters.[42]

Although not apparent today, the original 16-acre site of Peel Park is situated near the top of a hill and offered, according to the *Macclesfield Courier*, 'a pleasing and extensive prospect over the surrounding beautiful country', which was exploited in Barron's design. Following the requirements of May and the other promoters, much of the central area of the site was set aside for sporting activities and the park incorporated one of the largest bowling greens in the country, whilst other spaces were provided for gymnastics. The park featured gothic entrance lodges, gates, and a pavilion from which led a serpentine walk down to terraces reached by stone steps and surmounted with vases. The bowling green was encircled by terraces and fences of *Arbor vitae* 'after the Italian style' and planted with Barron's signature Irish and golden yews. At each angle were 'elevations planted with groups of shrubs intermingled with ornamental vases and designs in terra cotta', whilst the series of artificial, elevated mounds also provided echoes of Elvaston and exploited the extensive views available from the site. One large mound on the eastern side of the grounds near the entrance and ascended by a winding path, was studded with evergreen trees and shrubs and offered 'a magnificent view of the surrounding country' towards the Cheshire–Derbyshire border and the Staffordshire Peaks.

Leaving the gardens of Westbrooke House on the right, a walk conducted the visitor to the 'more park-like' and 'picturesque' 'portion of the grounds', which were intersected by the serpentine drive to Westbrooke where fir trees had been planted, some of which were encircled by 'rustic seats'. On this side of the park the land sloped abruptly down to a wooden vale, at the bottom of which was a 'bubbling brook' that formed the boundary between the Macclesfield and Upton townships. On the other side, the ground rose and upon this, to the east of the residence and pleasure grounds of Killmister, was the cricket ground. A 'circuitous walk, cut through a plantation of ornamental trees' took the visitor to the bottom of the dell where it was possible to glimpse 'another beautiful view' of the surrounding country. Ascending by a continuation of this 'constitutional walk' the visitor then came upon the gymnasium and had now completed a circuit of the park that brought them back to the entrance lodge. Within the grounds and comprising 8 or 10 acres, was a levelled lawn for the cricket grounds, one being adapted for juveniles and the other for adult players with room for football, skittles, prison bars and other sports and games.[43]

The whole provided, according to the *Courier*, 'the shape of smiling lawns, graceful slopes and terraces, beautiful promenades and ornamental plantations'. Barron's design

features planting of trees and shrubs mainly around the perimeter of the park. However, there were important groups of trees and shrubs in other locations, providing picturesque effects. Although this was later forgotten, following Barron, May emphasized that the planting was also arranged to 'educate the eye to the true harmony of colours', trees and plants being positioned in 'classes to exemplify their tribes' providing a further echo of the pinetum at Elvaston.[44] Barron placed artificial mounds covered with rockwork, plants and some trees which provide another reminder of Elvaston (Plate XIV).

As might be expected from the designer of Elvaston, much of the planting is dominated by evergreens and especially yews placed at strategic locations, emphasizing divisions within the park and in front of larger trees, so that they tied together groups of planting. For example, as at Elvaston, there were yews at the main entrance to the park echoing those at the south entrance lodge and gates. Barron's method was to use the planting of trees and shrubs and other objects to frame particular views, such as those available from the Dell and artificial mound, as visitors walked through the park. He considered it to be of the utmost importance, both for the purpose of providing shelter and 'for effect and depth to pictorial views which may be produced afterwards, to plant thickly all backgrounds as a primary operation'. Much importance was attached to the effectiveness of these views. According to John Watts, one of the Manchester park promoters, the beauty of the Macclesfield site with its gentle undulations combined with the beauty of the views to 'contribute to the richness to the landscape'. The 'ruggedness of the distant hills' excited 'ideas of the sublime and infinite, and by detaching us from the petty affairs of the present hour, expand the mind and fit us for nobler efforts'. Even the inmates of the local workhouse under 'the influence of the surrounding scenery' might develop from some of 'the worst specimens of human nature' into 'true men and women'.[45]

Barron was particularly critical of the types of deciduous trees that dominated many parks and plantations, claiming that his views were justified by psychology and medicine. He complained at how common it was to see 'close to our mansions, such commonplace things as elms, ashes, sycamores, poplars' or other 'rubbish that the nearest provincial nursery may happen to be overstocked with'. These were 'all stuck in to produce either immediate or lasting effect!' Deciduous trees provided a 'continued litter of decayed leaves', 'an unwholesome effluvia' during the winter and 'an assemblage of leafless stems' offering no shelter or protection 'from bleak winds for seven months in the year'. He claimed that fond as he was of the study of trees, 'the construction and consequent peculiarities of the human mind' was 'a subject of deeper interest still'.

Barron argued that individuals were differently constituted with varied tastes and enjoyments and different capacities to form correct estimates of 'form, size, proportion, texture, and colour of natural objects' depending upon capacities and cultivation of different faculties. The 'divine author' had constituted people to be capable of high enjoyments which depended upon knowledge and fulfilment of natural laws. This was proportional to the degree of organization or structural development of natural objects perceived. Hence, coniferous trees and shrubs excited admiration by providing an infinite variety of form, size, colour, texture and outlines 'from the formal araucaria and fastigiated Junipers, to the wild grandeur of the pine, and even to the delicate, graceful, and flowing habits of the Cryptomeria Japonica, Funebral Cyprus, Deodar Cedar and Hemlock Spruce'. Gigantic Lambert and Bentham pines, *Sequoia sempervirens* and Douglas Fir towered 'their lofty heads a hundred feet above the pride of British forests', providing pleasure from their unique dimensions whilst producing massive amounts of timber, demonstrating the economic importance of coniferous trees.

Placing different forms or colours of individual specimens or groups against different backgrounds could be particularly satisfying, such as the combination of large and small yews which provided backgrounds to golden yews, Irish yews and variegated white cedars and various form of junipers as at Elvaston. Evergreens were thus superior on grounds of health, practicality and neatness, providing enjoyment for an entire year and the Macclesfield and other park and cemetery commissions provided an opportunity for Barron to further the polemical objectives enunciated in the *British Winter Garden* and 'arrest the attention of the public' towards evergreens.[46]

CONCLUSIONS

Barron's work had a significant impact upon Victorian gardening, arboriculture and public park provision. He played a major role in the popularization of evergreens through the example of Elvaston, his landscape gardening practice, tree-transplanting and the development and supply of new varieties through the nursery business. Although Barron depended upon aristocratic patronage and received particular encouragement from the 4th and 5th Earls of Harrington, he was able to use this to develop a career as landscape gardener, nurseryman and tree-transplanter. His work at Elvaston helped to foster a new fashion for topiary, whilst the success of his advocacy of coniferous trees is evident from the inspiration he provided for many Victorian public and private gardens, such as Biddulph Grange, Staffordshire, and in major publications on the subject including the *Pinetum Britannicum* and Gordon's *Pinetum*.[47]

Barron's work was motivated by deeply held moral and religious beliefs. He remained hostile to evolutionary ideas and became a major figure in the temperance movement and vice-president of the national Temperance League, seeing his arboricultural, landscaping and nursery businesses as a means of furthering particular moral, religious and temperance objectives. Temperance associations were encouraged to undertake visits and to hold galas in parks and gardens, whilst Barron organized major temperance events at Elvaston.[48] The emphasis upon evergreens and the concept of the winter garden utilizing evergreens in novel ways was intended to provide all-year-round opportunities for rational recreation for urban populations. Under Barron's direction, evergreens emerged from the background and the role assigned to them by many picturesque landscape gardeners, tying together ornamental and usually deciduous specimens to become the primary focus. Barron's successful propagation and breeding of more colourful varieties of *Coniferae* was intended to remove one of the major objections to the widespread ornamental use of evergreens, the lack of colour and variety to delight the eye. Like the swelling Victorian cities, evergreens defied time and the passage of the seasons, like the growing industrial economy they were not idle for large parts of the year, but always showing their productivity and beauty.

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OWAIN JONES

ARNOS VALE CEMETERY AND THE LIVELY MATERIALITIES OF TREES IN PLACE

This paper tells a story of the Victorian cemetery movement and one particular and controversial example – Arnos Vale Cemetery in Bristol, south-west England. The narrative shows how places such as this are distinct spaces, but also fluxes of process where all manner of flows of materialities, politics, culture and economy come together to spatialize the place into being. This being is, however, unstable and given to change as variations in unfolding presences and agencies occur. Attention is first given to the emergence of the new cemeteries in the nineteenth century and the influential cemetery design of John Claudius Loudon and the tree planting he advocated. Trees were central to Loudon's 'cemetery style' and he drew on the vastly expanded palette of available tree species being collected from around the world, and on tree cultures/spaces from ancient times and exotic places, to develop his exacting specifications. Then attention turns to Arnos Vale itself and its markedly mixed and changing fortunes and formations over the last 170 years. This history is crosscut with current interests in the agency of non-humans and theorizations of places as dynamic processes with all manner of things coming together (intentionally and otherwise) over time. Trees bring their own lively materialities and temporalities to these places, which inevitably transform them, despite best laid plans, and reconfigure them in the shifting material space of the city and in the complex cultural contexts (local to global) which surround them.

> Trees are … at the heart of things. How could it be otherwise?[1]

Designed landscapes, and places such as gardens, arboreta and cemeteries, seem to offer us quintessentially cultural landscapes. They are socially constructed in terms of meaning *and* materiality.[2] 'Nature' is harnessed and manipulated. Meaning, power, ideologies of nature and landscape, and more (such as nationhood), are articulated through material arrangements which can be read as 'texts', not least through iconography.[3] The places formed seem first and foremost relatively static, bounded spaces which the social has created, readable as topographical and cultural spaces in terms of politics, power and economy, and through which the social moves.

Such views of nature, place and landscape are important in the way they challenge the 'naturalness' and 'giveness' of landscape and open up questions of culture, power and economy. Yet they are also being challenged by approaches which deny the sharp divide between the social (active) and the natural (passive) and the over-privileging of the social over the natural in terms of agency.[4] Non-human and relational agency is to the fore in these new approaches; places and landscapes are seen as processes as well as spaces, and the spaces themselves in more topological mappings of flows and connections.

Countryside and Community Research Institute, Dunholme Villa, Park Campus, Cheltenham, Gloucestershire GL50 2RH, UK

This paper tells the story of Arnos Vale Cemetery (AVC), in Bristol, south-west England, from these perspectives, treating it as a place in process. Trees are treated as key non-human agents, whose lively presences and actions have to be accounted for in gaining an understanding of how the cemetery, as a spatialized process, has changed over time. These theoretical orientations are first expanded upon in relation to trees and place, then the interwoven story of the nineteenth-century cemetery movement and AVC itself is told with a narrative thread which focuses as far as is possible on the trees of this remarkable landscape.

TREES AND PLACES IN MOTION

Trees are unruly things. Along with the atmospheric, landscape and habitat 'services' they provide, they grow, spread branches, sprout leaves, flowers and fruit, send out suckers, spread roots, produce and broadcast seeds, drop leaves (in one form or another) and limbs, block light and lines of sight, make a noise, move, harbour visitors, and die. They can live for hundreds of years and grow to a great size. Thus, they can be formidable presences, individually and collectively in the places where they are sited.[5] They can mark and make places.[6] As Murray Bail has it: 'it is trees which compose a landscape'.[7]

Thus, trees have forms of agency. But it is important to realize that their agency, as with the agency of other non-humans,[8] operates in very different ways to human agency.[9] Their creative capacities take different forms to those of other actors (and vary *within* the tree community). One important difference is that they generally operate at

Figure 1. Tombs broken by tree growth in Arnos Vale Cemetery, Bristol. Photo: author, 1999

very different velocities and rhythms to those of human action. The growth of trees is slow, even invisible by the standards of human movement. Longer-term perspectives, over decades and longer, are needed to see their agency at work. The hydraulic force of tree growth can be formidable. Trees can topple large blocks of masonry (Figure 1).

Places such as cemeteries, arboreta and gardens *are* spaces in a Euclidean sense. It is often easy to map them in terms of location, fixed boundaries (legal and material), and topographical features. AVC is a 45-acre site near the centre of Bristol surrounded on two sides by dense inner-city housing (Plate XV). It comprises a labyrinth of older and new paths and mosaic of areas used for burial and remembrance. There is a flat 'top plateau' and a curling flank of steep slope, which in part wraps around a further flat area by the main gate. Here are sited two chapels and a crematorium (Figure 2).

Figure 2. Draft management plan of Arnos Vale Cemetery showing paths and areas used for burial

AVC, and all other places, as well as being read as fixed space needs to be seen through three other related prisms. The first is that, as Doreen Massey suggests, they are fully 'wired' into the wider world in terms of flows and connections, even though they seem to have a separate and unique form and identity.[10] These flows are material, social, cultural and economic. No neat distinction or privilege can be made between the social (human) and the physical (non-human). The second, related view is that these flows fluctuate and change, combine and recombine moment by moment, day by day, year by year, decade by decade, etc. Places (such as AVC) are, then, 'processes unfolding through time'.[11] They are the outcome of many things (including people, ideas, economies, organisms, artefacts) coming and going, combining and recombining. Things brought together, thrown together, forced apart. There is an unruly chemistry to these combinings. There is contingency and unpredictability about how differing things turn up and interact.

The third prism follows from this. Within this unruly chemistry of place, things play a creative (even if destructive) part. Non-human agency has to be given 'its due'.[12] As Actor Network Theory insists, to attribute agency to the social world alone is a profoundly disabling misreading of the nature of everyday life.[13] Clearly, human agency has distinctive qualities but that does not mean that nature and the materiality of the world is rendered 'inert'. As Bruno Latour puts it:

> there might exist many metaphysical shades between full causality and sheer non-existence [in terms of agency]: things might authorise, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid and so on. … *No science of the social can even begin if the question of who and what participates in action is not first opened up, even though it might mean letting elements enter, that, for lack of a better term, we call nonhumans*.[14]

In this view, places are spatialized processes with a rich flux of throughput in which human and non-human actors are busy. The latter 'thing-power materialism' is an expression of 'the vitality, wilfulness, and recalcitrance possessed by nonhuman entities and forces'.[15] Places go though waves of apparent order and disorder as combinations of materials, actors and agencies recombine. They are the products of planning, ordering and construction (by human and non-humans), but can also be deconstructed, re/disordered by unruly, other agencies (human and non-human). They can be defended and carefully managed and maintained, but this takes effort. They can be terminated in a material sense, yet still live on as memories, maps, old photos, ghosts, and feint and material traces.[16] As Ash Amin and Nigel Thrift summarize:

> Places … are best thought of not so much as enduring sites but as moments of encounter, not so much as 'presents', fixed in space and time, but as variable events; twists and fluxes of interrelation. Even when the intent is to hold places stiff and motionless, caught in a cat's cradle of networks that are out to quell unpredictability, success is rare, and then only for a while. Grand porticos and columns framing imperial triumphs become theme parks. Areas of wealth and influence become slums.[17]

Given their formidable materiality and energies, trees can be particularly powerful reconfigurers of place, albeit caught up in a whole web of relational interactions with other agents. Their (literal) rootedness in place has implications, but they also need to be seen as mobile forces. Through self-seeding and plant collection and commercialization, trees species have been long on the move on local, regional and global scales and can turn up in a place like AVC. They are also on the move culturally and politically as landscape

and ecological sensibilities change around them. Once in place they can become fulcrums of all kinds of shifting management, cultural, political and emotional discourses/practices, as well as active material beings – growing, reproducing, moving, sounding, and going through their daily and seasonal routines.

AVC has morphed over time, transforming from one kind of space to another and then another, in contingent, unpredictable ways. This paper charts just some of the cultural and political 'events', often from far afield, but sometimes more local in scale, which have flowed into AVC and settled into a particular form. It considers the waxing and waning of order, a movement from chaos (elsewhere) to precise order, and then to disorder, and then on again to new futures and new orders. In this, trees have been key agents of change, but also in some senses, agents of continuity; the material presences of trees are extensions of political, symbolic and even ethical imaginations; and yet always exceed the roles prescribed for them. This is so even for the highly ordered and influential designs of John Claudius Loudon – the key figure in the development of Victorian cemeteries and other horticultural and arboreal spaces.

GRAVE DISORDER AND THE VICTORIAN CEMETERY MOVEMENT

One challenge of thinking about places in this way is to determine meaningful beginnings and meaningful moments of influence. All histories and places have a pre-history and all moments of beginning can be deferred. And many streams of action feed into the moments when processes combine and recombine to spatialize and respatialize a place into being and into change. However, at least part of the immediate genesis of AVC was the conditions in early nineteenth-century cities which gave rise to the new cemetery movement.

The inception of the cemeteries was bound up with a range of political, cultural and economic trajectories. This was an era of economic growth and developing nineteenth-century entrepreneurship and capitalism after the Napoleonic wars, when British wealth and power was booming.[18] The Industrial Revolution and related urbanization had caused town and cities to outgrow their fragile service infrastructures. Burial grounds became overwhelmed. In Charles Dickens's *Bleak House* (London, 1853), Lady Deadlock seeks the grave of her lost, destitute lover, Nemo:

> 'He was put there', says Jo, holding to the bars and looking in.
>
> 'Where? O, what a scene of horror!'
>
> 'There!' said Jo pointing. 'Over yinder. Among them piles of bones, and close to that kitchen wider! They put him very nigh the top. They was obliged to stamp on it to git it in. I could unkiver it for you with my broom if the gates was open. That's why they locks it, I s'pose', giving it a shake. 'It's always locked. Look at the rat!' cries Jo, excited. 'Hi, look! There he goes! Ho! Into the ground!'
>
> 'Is this place of abomination, consecrated ground?'[19]

Dickens did not exaggerate the shocking conditions of the urban graveyards of London, and he was careful to hint at unhealthy transfers, pointing out the kitchen window and the rat.

The old geographies of burial, small parish church graveyards and church vaults clearly could not cope with the growing populations of the newly industrialized cities. An ambition to impose a new material/spatial order on the disposal of the dead emerged amongst reformers and landscape planners. This was given added impetus by emerging non-conformist worship which took the body after death (and bodily resurrection) more seriously and thus required a more ordered internment. These momentums, combined

with the new economic energy and the emerging Victorian 'cult of death', set the scene for the creation of new urban cemeteries. Kensal Green in London was the first 'new cemetery' to be opened in 1833. This was the first of 'the magnificent seven' built in a ring around what was then the edge of the metropolis.[20] Leeds, Liverpool and many other growing cites soon had their own cemeteries.

AVC was first laid out as an Arcadian landscape between 1836 and 1840 by Bristol nurserymen James Garraway and Martin Mayes.[21] Like the other new cemeteries it was established by a private Act of Parliament, in this case an act of 1837, and financed by the sale of shares. The Bristol General Cemetery Company (the owners of AVC) was founded in May 1836 with a capital of £15,000 in £20 shares. The Act listed the names of one hundred and forty shareholders mostly local investors from the city.[22]

LOUDON'S ORDERS

John Claudius Loudon was a key figure in the development of modern gardening. He pioneered popular garden magazines, wrote *Encyclopaedia of Gardening* (London, 1822) and *Arboretum et Fruticetum Britannicum* (London, 1838).[23] He drew up a plan for London in *Hints on Breathing Places for the Metropolis, and for Country Towns and Villages, on Fixed Principles* (London, 1829), which sought to impose a new spatial order on the unruly city which was 'the most visionary landscape plan ever produced for a British city, despite a few eccentricities'.[24] Although his plan of concentric rings of city zoning was never activated, the idea of a ring of cemeteries around the edge of London had formed, along with Loudon's ideas for cemeteries as 'botanic gardens', which drew reference from overseas examples. As he put in a letter of 1830:

> allow me to suggest that there should be several burial grounds, all, as far as practicable, equi-distant from each other, and from what may be considered the centre of the metropolis; that they be regularly laid out and planted with every sort of hardy trees and shrubs; and that in interring the ground be used on a plan similar to that adopted in the burial-ground of Munich, and not left to chance like Pere la Chaise. These and every other burial-ground in the country, might be made, at no expense whatever, botanic gardens.[25]

Loudon was also of the mind that larger cemeteries could double as arboreta, an idea which had been proposed by P. Masey Jr in 1831 and published by Loudon in his *Gardener's Magazine* in 1836.[26] Something of his vision was emerging in the new cemeteries in London and which were to open elsewhere. But Loudon had his eye on the emerging design of the new cemeteries and became critical of the form they were taking. Bringing together articles previously published in his *Gardener's Magazine*, he published *On the Laying Out, Planting, and Managing of Cemeteries …* (London, 1843), some ten years after the opening of Kensal Green.[27] This was to have 'enormous and lasting influence' on how cemeteries were subsequently laid out and planted.[28]

The early cemeteries were 'usually laid out informally in the picturesque style'.[29] Loudon was critical of the spatial logic employed in the new cemeteries, particularly of the type of trees and other planting and their layout. As he put it, 'the planting of all the cemeteries is, in our opinion, highly objectionable'.[30] Loudon's concerns, and alternative proposals, are best illustrated by considering two drawings published in the book. The first shows the South Metropolitan Cemetery (designed by William Tite) as it was set out in the 'pleasure ground style' (Loudon's term for the picturesque style), and the same cemetery planted in what Loudon called 'the cemetery style' (Figure 3). In the first drawing the trees within the cemetery are planted in a form akin to the informal,

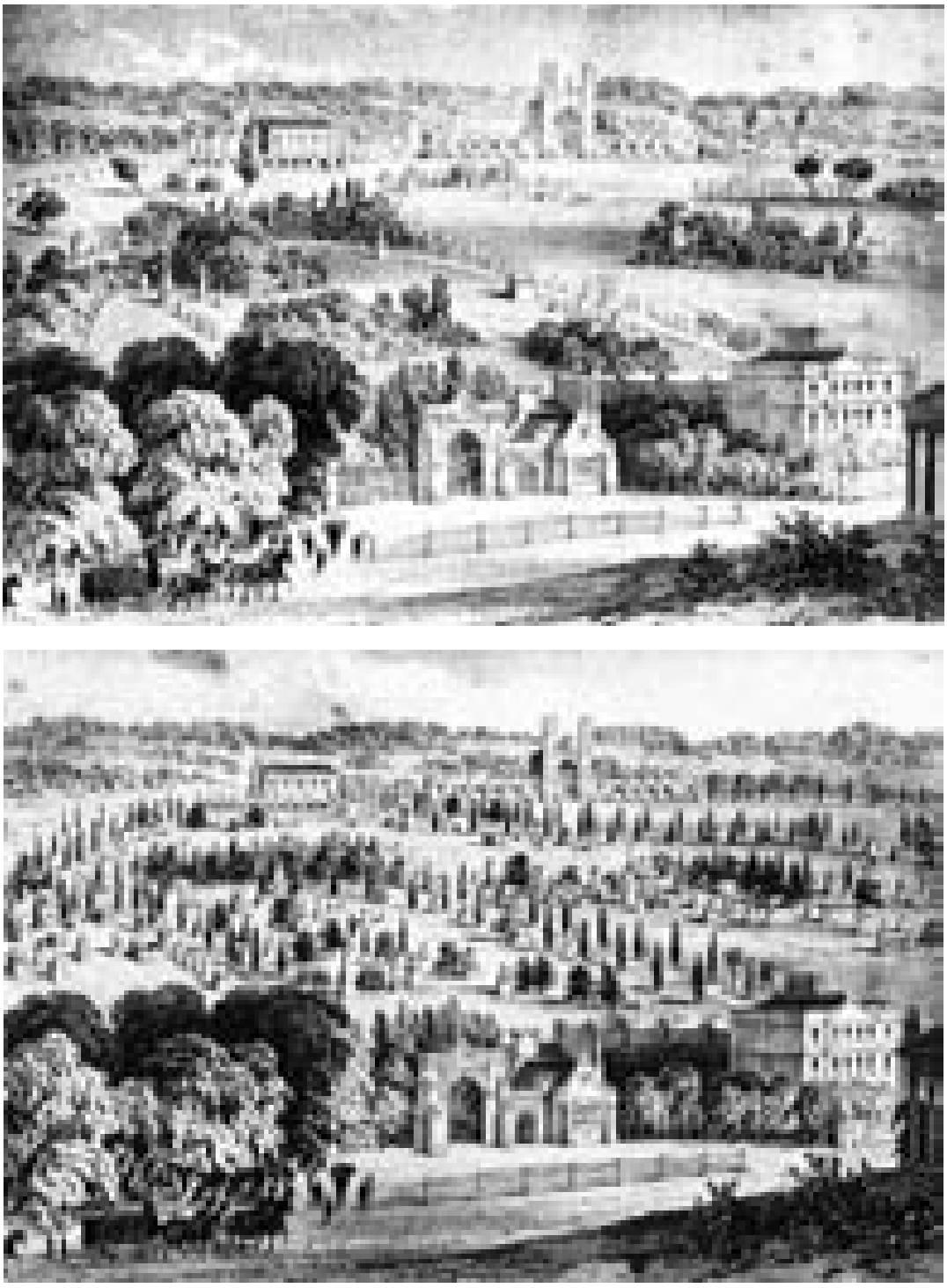

Figure 3. Two illustrations of the South Metropolitan Cemetery showing the actual planting (top) and John Claudius Loudon's proposed cemetery style (bottom); from John Claudius Loudon, *On the Laying Out, Planting, and Managing of Cemeteries and On the Improvement of Churchyards* (London, 1843)
Figures 3–6 are reproduced with the permission of Ivelet Books Ltd, Redhill

picturesque style emulating the influential landscapes of Repton with stands and copses of trees in otherwise open grassed spaces. Grave monuments line the main paths. The trees are mostly deciduous and native species. In the second drawing, showing the proposed 'cemetery style', the trees are mostly evergreen and planted singly, in a more open and even pattern around the same set of building and roadways. The cemetery is respatialized with a new order, deploying trees species brought in from around the world and chosen for particular characteristics (see below).

Loudon's precise spatial logic can be most clearly seen from a further drawing which shows 'an ideal layout on hilly ground' (Figure 4). This shows a network of major paths in sweeping curves which form a one-way flow of traffic from gate to chapel and back again. Between the main paths are regular, parallel, smaller paths, between which graves would be laid out. Tree types such as cypresses line the main paths and others larger conifers mark the key junctions. Smaller trees are shown planted decorously alongside already established graves. A double row of a more varied selection of trees follows the perimeter, showing how the suggestion that larger cemeteries could also serve as arboreta could be realized in practice.

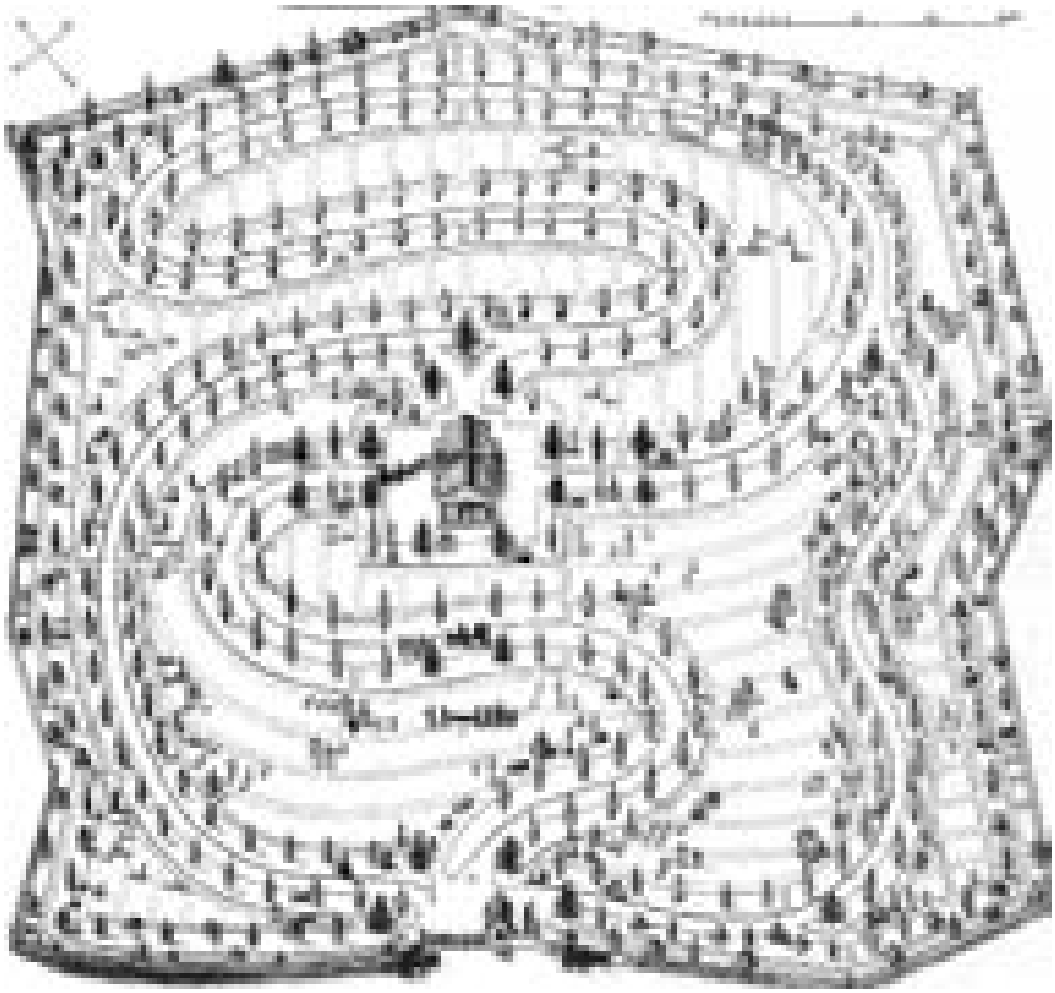

Figure 4. An 'ideal cemetery layout on hilly ground'; from Loudon, *On the Laying Out, Planting, and Managing of Cemeteries and … Churchyards*

Loudon's concerns with the existing planting schemes can be summarized as follows. Deciduous trees got too big, dropped huge amounts of leaf litter, had large and disruptive root systems, looked stark and bare in the winter; blocked light and lines of sight in the summer, created damp and shady conditions below their canopies, and, importantly, given the fear of 'foul miasmas', prevented a healthy flow of air, particularly when planted in stands. In contrast, the coniferous trees he advocated were generally smaller, more prim and sober in form and colour (matching emerging Victorian tastes), evergreen (thus not looking bare in the winter), had less vigorous root systems, and generated less leaf litter. Equally importantly, the evergreens had ancient associations with burial grounds across the world, notably the cypress and other evergreen trees which Loudon showed to be present in cemeteries in Persia and China in a series of illustrations in his book. It is worthy of note in terms of the purity of place, particularly when considering the emotionally and religiously laden ideas of places of burial and remembrance, that here there was an openness to 'alien species' from very different landscapes, cultures and religions. Loudon was proposing a new configuration of symbolic/material tree presences in the formation of these new places of burial.

To realize this new cosmopolitan arboreal order Loudon drew upon his vast knowledge of gardening and the emerging plant nurseries and collections which were gathering tree species from all around the world. Through the work of explorers such as David Douglas, many new exotic tree species were becoming available to form a vastly expanded palette for landscape designers. For example, Loudon lists Douglas's spruce fir in the fifth group of trees specified for cemeteries.[31] Loudon listed forty-four trees species which he considered to be 'cemetery trees par excellence'.[32] A further 127 species were suggested to add variation in larger cemeteries, thus further fleshing out the cemetery as arboretum idea. The cemeteries could thus be places of burial, remembrance, improvement and expressions of colonial power. The forty-four primary species Loudon advocated were broken down into nine groups, by shape, size, and branch configuration. These specifications, therefore, represent a very exact ordering of nature/trees in an attempt to control and precisely articulate the material relations and the produced spaces of the cemeteries. The first group of six are 'evergreen trees, with needle leaves, and the branches fastigiate and vertical' (the Italian Cypress being 'the best of all trees for a cemetery'); the second group of six – 'evergreen trees with needle leaves, of narrow conical forms, the branches horizontal'; and the last group of four is described as 'evergreen trees with needle leaves and pendant branches, peculiarly well adapted for being used in cemeteries so as they droop over monuments'. Graves, paths, drains and levels were all to be precisely detailed to ensure material and thus symbolic order, and the trees integrated into the design very exactly (Figure 5).

Looking at the very exact ordering of tree bodies in relational arrangements, where the trees, in ideal form, stand in static extension of the planned levels, one can see an attempt to fix time, life and landscape to a static form, to impose an order (Figure 6). These plans show a concerted effort not only to order new places of burial but to order the wider city as well. The unruly materiality of expanding numbers of people, bodies, diseases and decomposition was to be corralled and controlled in the new cemeteries. Natural actants, most obviously in the form of trees, were enrolled to bring specific functions to the new spatialized assemblages of the cemeteries. The trees were enrolled for symbolic purposes and also for their particular material characteristics such as shape and size and root configuration. Thus a tightly controlled flow of materiality in terms of tree species and of symbolism, and material arrangements from around the world was being attempted. As the very precise drawings show, the trees were being used almost as

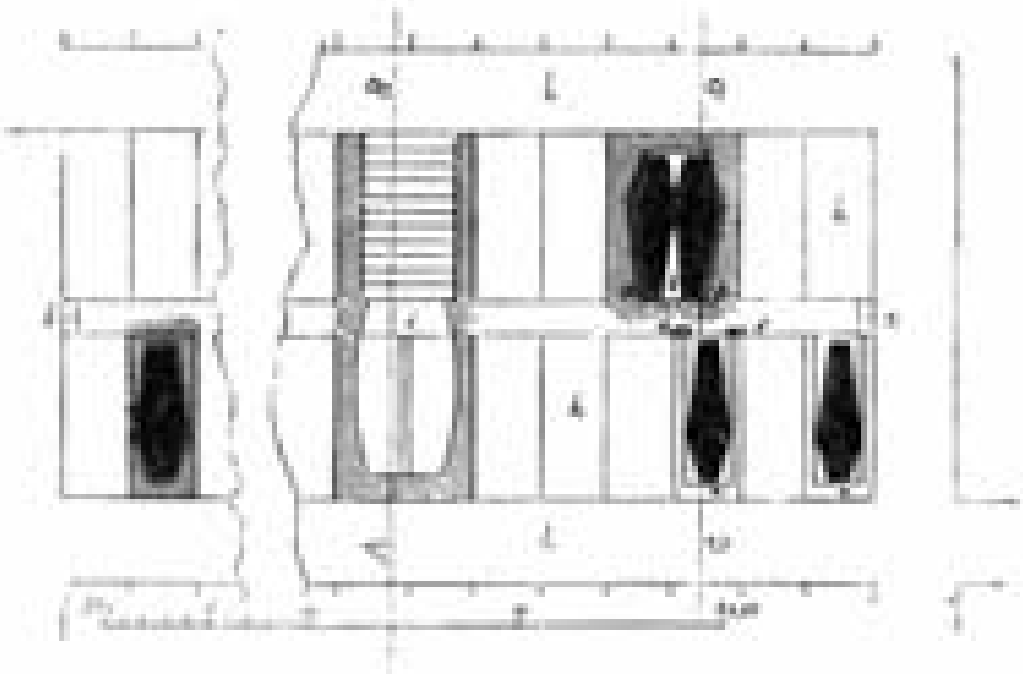

Figure 5. A precise order to counter the chaos of the urban burial grounds; from John Claudius Loudon, *On the Laying Out, Planting, and Managing of Cemeteries and … Churchyards*

Figure 6. Trees precisely fitted to an ordered design; from John Claudius Loudon, *On the Laying Out, Planting, and Managing of Cemeteries … and Churchyards*

inert matter. They were expected to take their place and stand quiet while the business of the cemeteries unfolded around them.

ARNOS VALE CEMETERY IN THE NINETEENTH CENTURY

It is not clear if Loudon visited AVC or had any direct influence on its design. He did, however, apply his design for a cemetery on hilly ground (Figure 4) in the layout of Abbey Cemetery in Bath (opened 1844) only some 15 miles east of AVC. And Masey Jr's designs for a proposed cemetery in Bristol, which were published by Loudon in 1836, were never realized.[33] However, the ideas, designs and tree specifications Loudon advocated seem to have been applied in the unfolding design and planting of AVC, as they were elsewhere.

AVC was originally 24 acres formed out of 'a pleasant country house, set in completely rural surroundings, the estate extending to 40 odd acres'.[34] This switch of land use becomes significant in the future of AVC because some mature deciduous trees were inherited into the new layout of the cemetery and, also, almost one hundred and fifty years later, some of the biodiversity of the once rural landscape became a significant factor in the cemetery as it returned to wilderness and became a green space in the city. Many of the nineteenth-century cemeteries are of interest in terms of biodiversity because they are fragments of once rural land which have not been fertilized and reseeded. Once management recedes, wild flowers, habitat, and related fauna recover and bring important areas of natural history to the cities.[35] This is testament to the endurance of nature within/through human orderings.

Barb Drummond suggests that 'one of the hardest things to imagine today is what Arnos looked like in the early days'.[36] She considers early depictions are somewhat contradictory. But the one on the cover of her history and one of the earliest depictions of AVC show very similar depictions of the new buildings and a scattering of new monuments and trees (Figure 7). Drummond suggests that the large deciduous trees are 'probably original oaks'. The inherited large deciduous trees were material continuities from the previous land use, which were also to have implications in the future. In the short-term they lent themselves to the initial picturesque style of planting so frowned upon by Loudon. In the longer-term they were powerful actors in the cemetery as it fortunes and formations changed.

Reports in local newspapers and early photographs show that AVC soon took up the cemetery style advocated by Loudon. The *Bristol Mirror* (29 March 1845) tells how

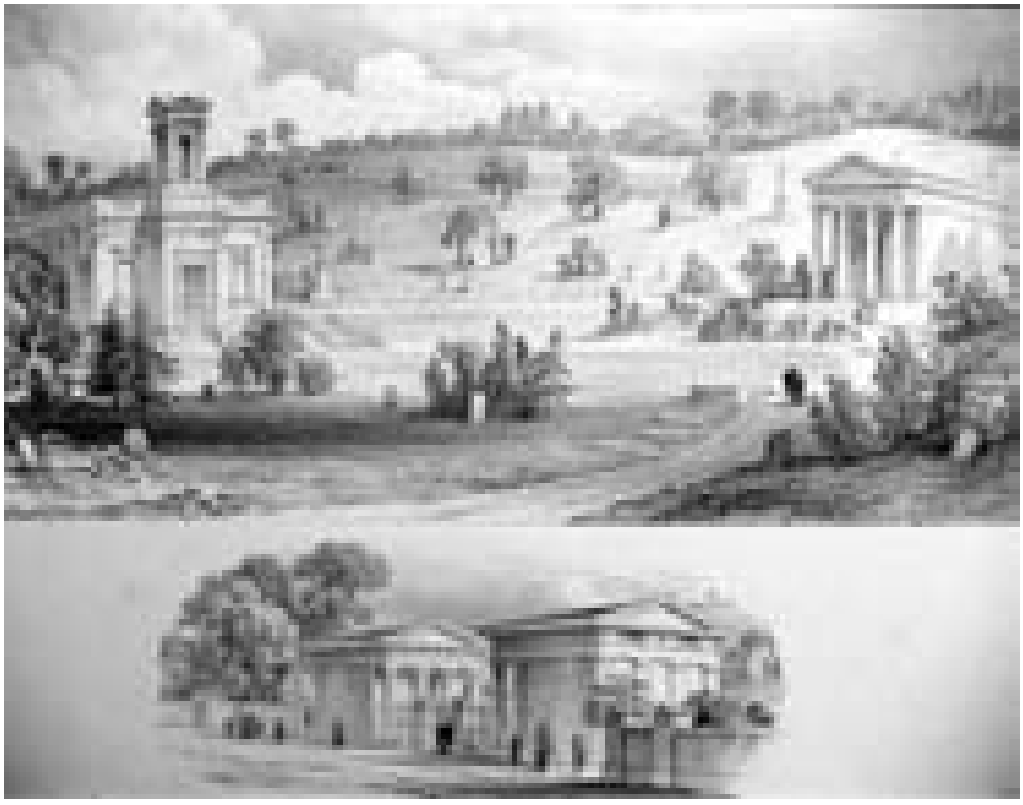

Figure 7. One of the earliest depictions of Arnos Vale Cemetery (*c.*1845)

a Bristol nursery (Garraways) had been engaged to plant trees and extend and improve the path network and that:

> the directors have ordered various walks, paths and terraces to be immediately formed, and nearly 2000 trees and shrubs viz cyprus, red cedar, juniper, yew, laurestinus, laurel, common and variegated hollies, Austrian pines, arbutus etc. are to be planted this season.[37]

All these are evergreen trees and listed in Loudon's book. Therefore, it seems that there was a large influx of Loudonesque tree species, some recently collected from around the world, supplied by a local nursery and financed by local investors, to make a new order in the cemetery. Some of these trees and the sweeping paths typical of Loudon's cemetery on hilly ground design can be seen in the earliest photograph (1866) of AVC (Figure 8).

GOLDEN ERA OF ORDER AT ARNOS VALE CEMETERY

The latter decades of the nineteenth century were, according to the local historian Les Owen, 'the golden years of AVC'.[38] The burial grounds within the city of Bristol (as in other cities), with a few exceptions, were ordered to be closed in January 1854 under the Health in Towns Act. This boosted the 'trade' of the new cemetery considerably, and for the next fifty years or so AVC was the city's principal place of burial. The monuments in the older parts of the cemetery were witness to the growing political and industrial importance of Bristol. Press reports of the time told how the cemetery was 'a beautiful spot, very carefully conserved and admirably managed'.[39] Photographs and illustrations show dramatic funeral processions of carriages, be-plumed black horses and following mourners leaving the city en route to the cemetery.[40]

Figure 8. Arnos Vale Cemetery, 1866

Therefore, by this time an incredibly dense set of flows had arrived into AVC, settling out into a new spatialization of the burgeoning cemetery space. The social pressures which spurred the cemetery movement, the ideas and designs of Loudon, legislation and Acts of Parliament, the money of private investors, the bodies, graves and monuments of those buried there, the toing and froing of funeral cortèges and mourners, the management and staff and the tools of their trade for producing new graves and maintaining this 'carefully managed' space. Also there were the trees, now representing some of the arboreal wealth of the world. A picture of 1887 gives some impression of the place at this time with growing areas of graves and a mix of mature and younger trees.[41]

DECLINE AND GROWTH IN THE TWENTIETH CENTURY

The twentieth century was a story of accelerating decline in AVC's fortunes as a business and ordered place of remembrance, but also growth in terms of a city green space. By 1906 there had been some ninety thousand interments and, although not all these were represented by individual graves, there were increasingly large areas with closely packed graves which presented considerable demands in terms of management and maintenance.[42] The logic of the new cemeteries, and Loudon's order, was becoming a victim of its own success at AVC and elsewhere. As well as increasing pressures of management, AVC now faced local rivals for its business. Seven rival cemeteries were opened in the city between 1883 and 1923.[43] All these remain open and are run as municipal cemeteries, having been taken over by the council after being started by private companies or Church Trusts. The city opened a further purpose-built, modern cemetery in 1974. By 1926 the cemetery had grown to its full, 45-acre size (having been expanded for a third time) to deal with the pressures it was under, but it could expand no more. The city has grown around it, and far beyond. The densely packed terraced streets of inner-city Totterdown back onto two sides of the cemetery.

Latterly AVC became, to some, a rather gloomy, forbidding, decaying Victorian mess, and the more orderly, airy municipal cemeteries were preferred as places of rest. Burial for profit became more frowned upon. The decline of AVC was common to many other of the privately financed cemeteries of the same era. Many of the private cemeteries were under-capitalized from the outset, and had not allowed for rising costs in their start-up calculations. Their once-elegant assets became fearful liabilities, as costs mounted and revenues from burials dwindled. By the 1960s, crisis point was being reached. Some companies locked the gates and simply walked away for good: Highgate Cemetery and Nunhead Cemetery were effectively abandoned until local groups decided to find a way out of the impasse.[44] Unlike many others, however, AVC remained open until 1998 and in private ownership until 2003. This proved to be highly controversial.

ARBOREAL LIFE

All the while, of course, the trees in the cemetery were active, growing, and seeding and doing all the things trees do, taking advantage of the roll-back of management to grow beyond their allotted spaces and roles, and finding places to germinate and grow. Graves, and the joints in grave masonry, offer good nurseries for young trees to get established – safe from mowers, strimmers, wild animals or others bent on their destruction. In some areas, each grave seems to have a companion wild tree growing close alongside or even from within the stonework itself. In some instances, the movement of the tree growth is eloquently expressed by displaced masonry (Figure 9). The planted evergreens also spread and grew too big for their once carefully selected positions and in some cases enveloped significant monuments in dense foliage (Figure 10).

Figure 9. A wild tree seeded in a grave bed and slowly displacing masonry. Photo: author

Figure 10. Cutting back growth which had enveloped a monument. Photo: author

Other trees acted as rather strange agents of wonderful form.[45] There are at least three weeping ashes in AVC. These are rather extraordinary looking trees with extravagantly twisting branches which reach down to the ground. Their rather dramatic appearance lends them to planting in cemeteries. Weeping ashes cannot be grown from seed but are produced by grafting cuttings onto common ash rootstock. Although they look so remarkable and very different from ordinary ash trees, the seeds they produce are of ordinary ash trees. Ash trees are very effective colonizers of open ground, producing prodigious amounts of ash keys (seeds) which are distributed by the wind, and growing quickly (in tree terms). It is likely that it is the weeping ashes, carefully produced and planted for their ornate appearance, which have spread thousands of common ash saplings throughout the cemetery. There are also a few venerable and large sycamore trees in the cemetery and these also have generated new generations of young trees competing with the ash.

There was a period of renewed management effort in the early 1980s when community work programmes were brought in to help clear the spreading wild wood and brambles (Figure 11). These works cleared paths and restored steps on the steeper slopes but they were short lived. In effect they did little more than coppice much of the wild ash and sycamore and conveniently cleared away competing bramble. Less than a decade later parts of the cemetery were a forest of straight, young ash and sycamore saplings (Figure 12). By now many graves were being toppled or split open, and the tree cover in some older areas had become so established and continuous that large parts of the cemetery were effectively becoming urban woodland (Plate XIV).

RESISTANCE AND ENROLMENT, ORDER AND DISORDER

Ownership changed hands in 1987 in rather strange circumstances when the cemetery was taken as payment for an unpaid bill. It now seems clear that the new owner saw the site as a possibly lucrative development prospect. This was the era of Thatcherite urban

Figure 11. Clearing tree growth in the early 1980s. Photo: Peter Brain

Figure 12. In previously cleared areas a forest of coppiced ash and sycamore soon took root. Photo: author, 1999

development and other cemeteries had been controversially sold for knockdown prices and cleared for development.[46] It was announced in the *Investor's Chronicle* in 1994 that a company 'had been retained to advise on seeking permission to develop up to 30 acres of the cemetery with 400 houses'.[47] In a newsletter, the owner advised that those with relatives buried in the areas targeted for redevelopment should consider 'exhuming the remains for re-burial'.[48] This was thus a critical moment when the cemetery as a material place could have been cleared or greatly diminished. The trees were complexly woven into this period of uncertainty for the cemetery's future.

The growing presence of the trees was contributing to the cemetery's decline as a place of burial, remembrance, and historical and architectural heritage. The owner was accused of 'letting the trees do his dirty work', reducing the condition and historical interest of the cemetery to such an extent that plans for redevelopment would face dwindling opposition.[49] Access to many graves, and whole areas, was difficult and dangerous in many places, and just about impossible in others. Many monuments were already beyond repair. In addition to this reduction of cultural heritage, the spreading wild trees were also reducing the valued biodiversity of the cemetery by spreading over areas of rough grassland, which were rich in flower species and insects. But the trees, also, were becoming of landscape and urban green space interest, and part of the efforts to conserve the cemetery. Countervailing forms of monitoring and surveillance enrolled the trees in protest and resistance.[50] An extraordinarily detailed tree survey was carried out by a local amateur botanist, mapping and listing some 1350 trees on the site in the mid-1980s. This information was later used in the drawing up of a draft management plan, submitted to and initially ignored by the owner and the city council. The survey itself, and photographs of the cemetery at this time, can be seen as frozen moments of time, for a decade or so later the tree survey detail would be lost in the burgeoning growth of the unmanaged trees (Figure 13).

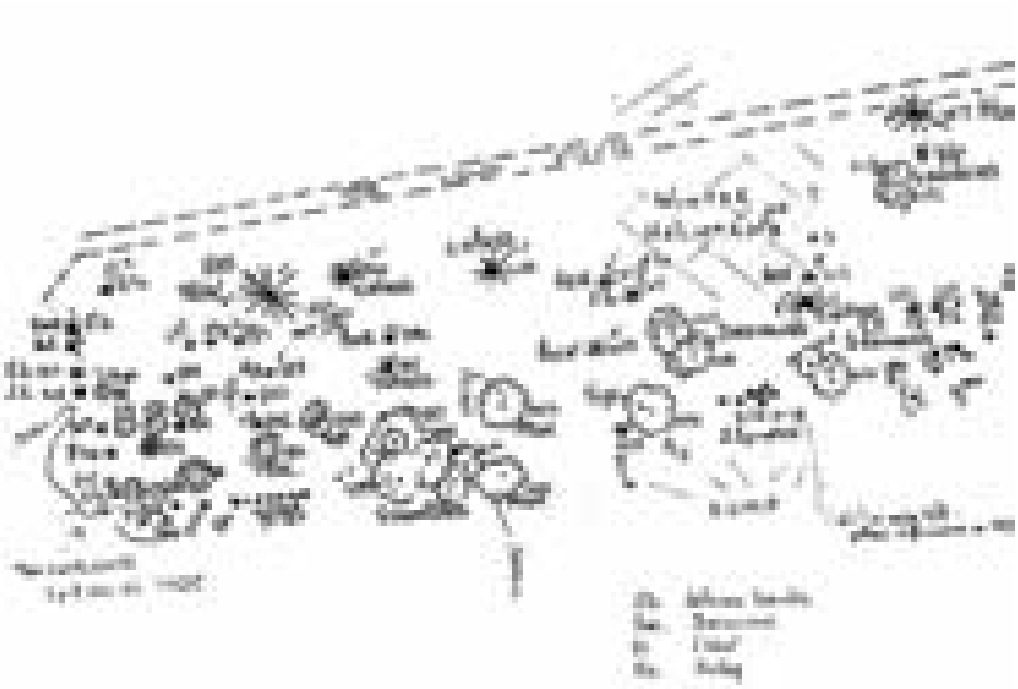

Figure 13. Detail of the Tree Survey by Peter Brain

The history of the site ensured a rich arboreal presence in the cemetery (as in others). Tree Gazing walks (Figure 14) were conducted in the cemetery to celebrate its arboreal treasures, organized by Mr Tony Titchen who drew up the following unique list of tree species, forty in all: female monkey puzzle, Lawson cypress, golden form of Lawson cypress, yellow form of Lawson cypress, south European cypress, Sawara cypress, Nootka cypress, black Austrian pine, western red cedar, cherry laurel, yew, Irish yew, holm oak, purple cherry plum, double Japanese flowering cherry, holly, field maple, English elm, Japanese spindle, sycamore, false acacia, English hawthorn, horse chestnut, double Midland hawthorn, Himalayan cedar, English oak, laburnum, cherry, rowan, weeping ash, common ash, lilac, aucuba laurel, variegated English holly, Lebanon cedar, elder, European larch, bird cherry, Norway spruce, and apple.

The trees collectively had become a dominating material presence at AVC. The 1997 Local Bristol Plan noted that AVC was a significant open space and its 'prominent green hillsides' were listed in the 'Principal Landscape Features' of the city. The newly wooded cemetery became caught up in all the environmental discourses which gathered around trees in the contexts of global environmental concern, nature conservation, global and national deforestation, the national tree protests of the 1990s, the greening of cities and trees as panaceas for urban regeneration.[51] Trees were understood as bringers of improved well-being and cleaners of the environment. Any threat to what in effect was a large wood in inner-city Bristol was bound to attract adverse attention.

Protests and resistance had steadily grown about the state of the cemetery and this accelerated as the threat of development emerged. The Association for the Preservation of Arnos Vale (APAC), later becoming Friends of Arnos Vale Cemetery (FAVC), was formed in 1987 and a series of very heated public meetings was held, where the owner and, on occasions, the council, faced much anger. For the following sixteen years APAC/FAVC and others campaigned for the cemetery's protection. They raised funds and published

Figure 14. Tree gazing with Mr Tony Titchen.
Photo: author

newsletters, which incorporated stories of key monuments and their links to local, national, and world history and stories of ecological interest. There was some tension between these two wings of interest in FAVC. Some who valued it for its ecological richness and 'wildness' were wary of the extent to which those who valued it primarily as a place of remembrance were campaigning for the cemetery, or many parts of it, to revert to a much more tidy, managed environment. Those concerned with clear access to graves and a dignified space of remembrance, were suspicious of the desire to 'let nature flourish'. But in the face of the threats to the cemetery these 'factions' worked together to lobby the owner and the council for action. The draft management plan, which identified areas to be restored and others to be left 'wild', was backed by FAVC. The local Bristol newspaper became heavily involved in the campaign to save AVC and it was, on occasion, headline news.

Loudon's order was now just about completely undone with the wild trees and the planted trees having slipped the leash of management and design, turning the site into

woodland. In some places small pockets of order could still be found, carved out of the surrounding wilderness. Some of these were graves still cared for by family members. Families who owned plots had the right to clear them and access to them (but to do no other work on the instruction of the owner). This clearing work often involved cutting back saplings growing around and through grave masonry (Figure 15). Other pockets of order were the war graves in the cemetery which the War Graves Commission has a duty to maintain.

A protest march was held ending up as a noisy occupation of the public gallery of the City Council chamber. The pressure group and local newspaper continued to be very critical of the council's position, but the council claimed that as AVC was privately owned there was little they could do in the short-term to coerce the owner to maintain the cemetery. The owner refused to cooperate with either the FAVC and its proposed management plan, or the city council, who had listed the site as Landscape Conservation Area and some of the key buildings and monuments as listed buildings. The council did eventually act to protect the buildings. The effort of doing so in terms of killing root systems of established ash and sycamore, indicated the size of the challenge facing any large attempt to remove the tree population (Figure 16).

AVC now contained an astonishing mix of monuments, ecology and history. Along with the war graves were those of people whose stories were bound up with city, nation or empire, for example a doctor who had given his life fighting cholera outbreaks in the city and engineers in Brunel's great railway project who had reliefs of steam trains carved on their headstones. One very striking monument is the tomb of Raja Rammohun

Figure 15. Cutting back young tree growth from within grave masonry.
Photo: author

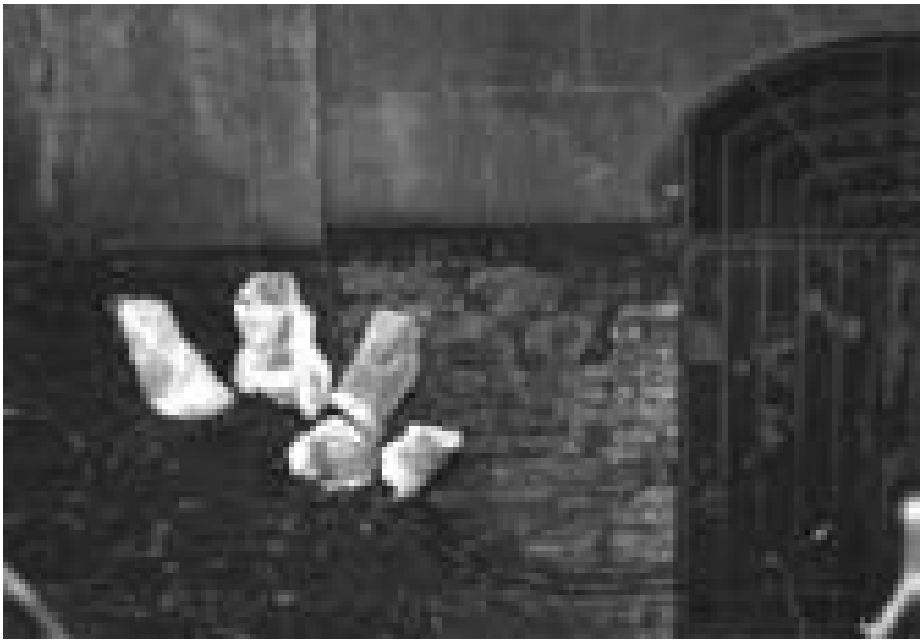

Figure 16. Efforts to kill stumps and root systems of wild trees near the main buildings. Photo: author

Roy (1774–1833) who died on a visit to Bristol. He is noted for his contributions in developing modernism and humanism in India and particularly to a campaign to end the custom of 'Sati'.[52] His tomb is a place of Hindu pilgrimage and a ceremony is held there each year.

TOWARDS RESPATIALIZATION AND A NEW ORDER

As a business, AVC was increasingly unsustainable. There were approximately fourteen burials in 1998 and, by then, turnover and profits before tax dwindled to very low levels then to loss.[53] Those few still being buried there were relying on previously paid for burial plots. The viability of the business was dealt a final blow when the crematorium, which had been opened in the 1950s (there had been cremations since 1928 in a converted chapel), was closed in 1998 under the Environmental Protection Act of 1990. The owner then finally closed the entire cemetery (31 March 1998). However, the legal position was complex as many people owned future burial rights and plot leases until 2050. Furthermore, those with family graves in the cemetery still retained the right to maintain access to, and the immediate area around family graves – but still the owner refused permission for any other work to be done at all. Volunteers did try to carry out remedial work on some of the significant monuments, but were threatened with court action.

Closure in fact meant the gates of the cemetery were left open and unattended. It was feared this would lead to an increase in vandalism and theft from the cemetery. The 'Arnos Vale Army', an unofficial group, was formed, and organized volunteers to 'man' the gates everyday and then lock the gates each night. The owner tried to have them evicted but was not supported in court. The council finally decided to act, and put pressure on the owner by serving notices in regard to the listed buildings which were now in poor condition. When cooperation was still not forthcoming, they began a process of compulsory purchase and established a Trust to which ownership would be transferred. Regeneration studies were conducted by local architects which referred back

to the earlier plans drawn up by APAC and Heritage Lottery Funding applications were prepared. Ownership was finally transferred to the Trust in 2004.

By 1998 there were over forty thousand graves containing over five hundred thousand deceased.[54] This is an amazing coming together in itself. Add the living presences, knowledges and practices (human and non-human), the ecological, the monuments with their stories and iconographies, and the richness of place grows exponentially. The place is now on the move towards a new spatialization in which the trees are again central. The very latest (at time of writing) FAVC 'News Letter' reports that:

> This year the site has been a hive of activity with tree works … as part of the woodland management programme. … This involves removing self-seeded sycamore and ash trees back two graves widths from the principal paths around the wooded area. … The work will allow more light into the areas and encourage original species of plants to re-establish and historic trees to survive.[55]

This new round of 'twists and fluxes of interrelation'[56] is driven not least by the £4.8 million Heritage Lottery Fund finally granted to the Trust, but also a host of other actors such as the staff and the equipment that will follow. Many of the wild trees will be removed and this will change, quite literally, the nature of the place in terms of space, and 'the historic trees', which have managed to survive from one period of management to the next, will provide material links back to previous orders and spatializations of the cemetery. Something of the historic material landscape, but in a new form and in new political, cultural, and ecological contexts, will form.

CONCLUSIONS

Places are 'where spatial narratives meet up or form configurations, conjunctions of trajectories which have their own temporalities' as Massey has said.[57] In the narrative of place in process sketched out above, decades of history are jumped by in a flash. In those decades many people will have come and gone in AVC, as internees, visitors, rememberers, mourners, workers and researchers. At any given moment, the place seems solid and fixed. But over longer time frames the place is clearly on the move. This is partly due to the unruliness of the relational flux that turns up in the place and also non-human agents such as the trees. Their lively material presences have acted as unruly threads working at their own speeds and in their own ways, bridging between land uses, bridging between eras of politics and economics, helping to scramble order into disorder and then new order.

Of course, their agency is not reflexive as human agency, but it can be seen as creative and meaningful. For to account of the history and present condition of the place without their active presences would be impossible. Due to the very rich mix of material, imaginary and emotional threads, AVC has been, and remains, many things to many people. A place of burial, a place of remembrance, a quasi wood and even an informal arboretum, a place of urban ecology, a place of economic decline and development opportunity, a place of problematic civic politics. It is only by taking a fluid, relational, hybrid, process view that we can do justice to such entangled narratives and such entangled material relations. Other places and other landscapes, other places of trees, will have similarly fluid stories.

Lawrence Buell in his discussion of place, points out that Least Heat-Moon's *PrairyErth* (London, 1991) is 'the most ambitious literary reconstruction of a small portion of America'.[58] But, despite running to roughly two hundred thousand words, it only scratched the surface of the seemingly simple place represented. As Least Heat-Moon admits, 'ninety-nine-point-nine to the ninth decimal of what has ever happened

here isn't in the book'.[59] The full richness of places can never be represented. They are not merely processes and narratives but whole 'ecologies of interrelating trajectories' which settle into temporary local material forms, but which also have threads which weave out though local, national and world space. No doubt, places where trees are present can be found that have been much more stable over time, but this will be through dint of management and effort – agency to countervail agency. And even then, no places, no landscapes are just (fixed) spaces, they are all in process and in motion.

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DIVYA P. TOLIA-KELLY

ORGANIC COSMOPOLITANISM: CHALLENGING CULTURES OF THE NON-NATIVE AT THE BURNLEY MILLENNIUM ARBORETUM

This paper examines the concept of cosmopolitanism in contemporary cultural theory which has not been embraced in modern ecological discourses and practices committed to legislate against cosmopolitan landscapes made up of 'native' and 'non-native' plant species. These tensions are examined through the example of the Burnley Millennium Arboretum, where three thousand non-native trees form part of the urban Arboretum. The Arboretum is examined in the context of local authority initiatives set up by central government to address and enable racial cohesion in this region since the race riots of 2001. The organic cosmopolitanism represented at the site of the Arboretum challenges the orthodoxy of contemporary ecological categorizations of 'native' and 'non-native'. The Arboretum also represents a site where, through memory and cultural dialogue, a new civic pride and citizenship is being forged for this multicultural community. Visual methods have been used to chart the memories of past landscapes and the contemporary experiences of place that British Muslims have had in Pakistan and do have with the Burnley landscape. The community's sense of feelings of isolation, exclusion and fear are recorded on canvas. The paper concludes with a re-evaluation of the possibilities for cosmopolitan values for both diasporic communities and environmental communities in contemporary Britain.

NATION, CULTURE, AND COSMOPOLITANISM

Recent research has considered political questions about the nature of Britishness within history, sites of heritage, landscapes and in relation to nature. Of particular interest are two areas of modern citizenship; firstly the ways in which migrants and transnationals (and their cultures) are situated as 'marked' or racialized, and which continue to sit outside our cultural landscapes.[1] Sites of cultural citizenship include broadly the territories of the National Parks, such as the English Lake District, and the spaces of our island story that are cultural signifiers of Britishness, such as the networks of museums and sites of English Heritage.[2] The overall concept is a genealogical understanding of historical process that reflects on classifications, iterations and the development of ways to 'fix' narrations of heritage that occlude plural vision of Britishness, one that for example reflects the mobile and circulatory values of nation, nature and landscape that have shaped our national culture, post-Empire.

In this second area of landscape values, nature and enfranchisement to territory in Britain, the historical presence and contribution of mobile migrants has been long lived, and thus need to be threaded through our narratives of landscape and acknowledged in our cultures of citizenship.[3] A plurality in approach is a necessary shift of our categories of

Room 412, West Building, South Road, Science Site, Durham, Co. Durham DH1 3LE, UK

national nature and our cultural practices of being and living within the landscape.[4] These shifts would include redefining our cultural classifications beyond notions of 'native' and 'non-native' natures, peoples and landscapes. These concepts suggest the possibility of an enfranchised transnational cultural landscape, one where dominant hegemonic cultural practices embrace diversity, heterogeneity and diaspora cultures. The Black Environment Network is an organization committed to continuing to raise issues of race equality in the environmental realms and which has a programme of 'Ethnic Environmental Participation'; these interests extend to cultural and natural categorizations which are disingenuous to British landscape history and which may exemplify questionable practices that constitute 'ecological racism'. In their 'Trees of Time and Place Campaign' they warn against the casual use of the terms 'native' and 'alien':

> In an era in which heart-rending pieces of news inform us of racist murders and ethnic cleansing, putting mortal fear into the hearts of every ethnic person, the distorted associations with these terms are extremely undesirable.[5]

This is an example of an environmental organization, embracing a 'cosmopolitanism' philosophy and practice towards human–nature relations in the British landscape scene.

As an advocator of natural and cultural cosmopolitanism, cultural theorist Bryan Turner argues that to achieve this sense of cosmopolitanism in the modern world requires a 'scepticism and distance from one's own tradition' forming the basis of 'an obligation of care and stewardship for other cultures'.[6] Turner's definition, if applied to a national landscape culture, would be one where in Britain we would attend to evolving a cosmopolitan attitude to cultural landscape and nationality, and essentially embrace those citizens and natures classified as 'non-native'. It would be one that considered 'mythologies' of landscape and nature within the realms of cultural classifications and different senses of time.[7] The Millennium Arboretum at Burnley is a site where that care and stewardship has been embraced on the small scale, in modest fashion. It is a material landscape of organic cosmopolitanism, where notions of circulation of landscape values and natures are embedded in the ideological foundations for the design and practices of creating the Arboretum. This is setting notions of cosmopolitanism within a multiracial district of Britain which is not normally considered within the realms of 'studying cosmopolitan landscapes' (Figure 1).[8]

This paper explores the need for a transcultural approach to and cosmopolitan definitions of both natures and cultures beyond the terms 'native' and 'non-native'. It starts by situating the relationship between landscape, nation and culture within historical writings on landscape. The second section reports on the research conducted with the British Muslim community living in Burnley and the lived experience of migrants in this area. In the third section the Arboretum and its role in the racial cohesion strategy in the Burnley area is illustrated. It has become the site of urban landscape where a cosmopolitan vision of landscape, ecology and culture is growing within the landscape of Burnley. It is a material artefact which in its dynamic form, is an attempt to challenge bounded notions of citizenship, through enrolling memory and the transnational ecological values of contemporary Burnley folk. The paper concludes with a re-evaluation of cosmopolitanism in the form of the Arboretum and its ability to garner civic pride amongst the Burnley community.

CULTURES OF 'NATIVE' IN LANDSCAPE HERITAGE AND NATURE

In geographical writings on landscape, David Matless and Stephen Daniels record the genealogies of cultural landscape values which challenge the 'traditional' elisions

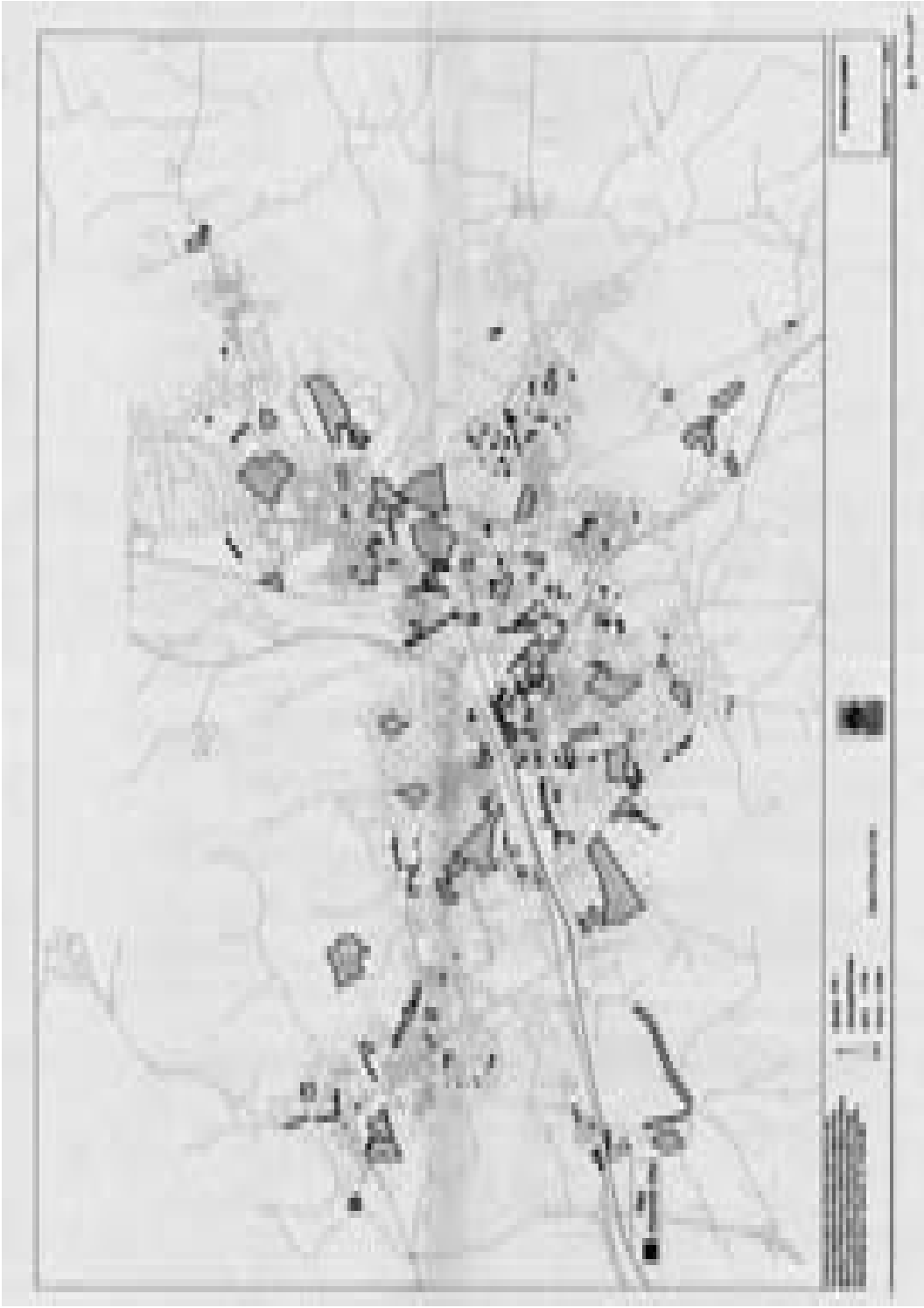

Figure 1. Map showing the sites of arboretums; Burnley Borough Council: Licence No. LA-077364 (2003)

between English*ness* and England.[9] Through this work, the seemingly benign and objective discourses of Englishness have been re-orientated through a critical lens, thus exploding the mythologies of an English landscape culture that is separate from industry, multiracial influences and modernity itself. However, writers such as Ian Chambers argue that there is more work to be done on the question of race, or more accurately racialized populations that are 'British'. Chambers argues that this is long overdue, his argument is that:

> even radical critics and historians such as Raymond Williams, E. P. Thompson, and Eric Hobsbawm have, in their appeals to the continuities of *native* traditions and experiences, perhaps inadvertently conceded the ethical and racial pretensions of a national(ist) mythology.[10]

Within the iconography of the British landscape Englishness or Britishness has traditionally been situated as a cultural way of being that is 'rooted', 'fixed', and integral to a relationship with land, country, soil and a moral sense of being and understanding this place; writers such as Phil Kinsman, photographer Ingrid Pollard,[11] and others have attended to the seeming discordancy between black bodies and the landscape of the English lakes for example. These are positioned as 'non-native' to this cultural landscape. These writers are challenging the elision between 'native' peoples, cultures and natures. Environmental historians with their 'earth's-eye' perspective, also challenge theories of 'native' and 'non-native' through a consideration and inclusion of both the writing of history through global nature flows and a consideration of nature's own geologically linked time-lines beyond 'nation', 'state' and 'sovereignty'.[12] These environmental histories hold nature at their centre and assert 'others' that as a result are no longer on the margins of history.[13] By taking this approach to the complexities of the material landscape we can encounter a notion of geographical landscape history, where the multicultural nature of British nature and the cultural record is revisited with a new lens that recognizes the historical and material presence and influence of postcolonial peoples, natures and landscape values.

The discourses and definitions of 'native' and 'non-native' have various manifestations and genealogies themselves. Ecologists, botanists and landscape historians have all contributed to the debates about how 'non-native' species are invading, exhausting resources, and utilizing space traditionally occupied by 'native' plants and thus native cultural landscapes. These arguments are familiar to us because they have all been exercised in the cultural sphere, especially in the context of discourses on race in Britain, critiqued in the work of Stuart Hall and Paul Gilroy.[14] The roots of these discourses are in the practices of imperial governance and the cultural logic of colonial taxonomies and definitions of aboriginal peoples of every continent.[15] It has been consistently shown in historical and cultural investigations that in this sphere the questions of 'what is native?' and 'what is not native?' are culturally defined. In ecological terms, arguments are raging about which plants contribute to a notion of 'native' and 'non-native' species. Central to these definitions are questions of time. At which point do circulatory and mobile plant species become 'native? A well-known example of 'nativization' is the walnut tree, which is now defined by the Royal Horticultural Society[16] as 'naturalized' to Britain, as historically its 'origin' was the Americas, arriving in Britain in the 1700s.

Writers such as Nash and Gilroy describe this renewed currency of discourses of 'alien' and 'native' as evidence of the re-emergence of biological essentialism that is embedded in genetic science and which feeds into cultural racism.[17] For Gilroy this is termed an age of the 're-birth of biologism' (p. 34), which fosters biologically located evidence of race difference and notions of purity of genetic stock. These moves ultimately serve to bolster

political discourses that seek to define and reassert notions of 'native peoples' and 'native cultural values' and thus conflate with issues of 'cultural belonging'. These arguments are troublesome, especially because of 'the assumption that identity derives from deep-rooted association with territory has come to be seen as the key pathology of the modern nation-state; the root of its intolerance to foreign bodies.[18]

Julian Agyeman initiated the critique of the language of 'native' and 'non-native' as representing a form of ecological racism, arguing that in British environmental narratives and practice, there is a process of 'containment' in operation, keeping the ethnic racialized populations in specified landscapes, namely urban, and usually the most environmentally hazardous.[19] These cultural narratives are contrary to our embracing of notions of 'cosmopolitanism' that are celebrated alongside the benefits of globalization. There is a recognizable discordancy between our acceptance of the mobility of bodies across space and the narrating of national belonging and cultures of citizenship that incorporate mobile values and mobile British citizens. Nigel Clark further challenges these categories from a post-human perspective.[20] Reflecting on the new 'cosmopolitanism', he has recently argued that within cultural theory there is a segregation between 'nature' and 'culture'. He argues that what is important is that the social and cultural dimensions of the global process cannot be severed from the 'non-human' and that ultimately, we need to recognize that:

> disturbance, like mobility, invasion and hybridisation is endemic to the living world and thus, if it is the nature of 'life' to stick to it's own 'turf' then why are so many species from the taxonomic spectrum so eager for relocation and so well disposed to it?[21]

THE ARBORETUM

The Arboretum at Burnley is the site of a landscape where humans and non-humans are evolving into a new civic landscape and where cosmopolitan visions of nature have been imagined and forged in the modest form of an arboretum. It is intended as a material and metaphorical space of transcultural 'togetherness' rooted in notions of communal heritage, history and landscape cultures. The Millennium Arboretum at Burnley is an urban arboretum of one million trees planted in various sites across the Burnley Borough Council municipality. Many of these sites are at the edges of council estates, brownfield patches of land, and spaces that are marked for regeneration at the edges or 'margins' of residential or public sector service areas, such as schools, pathways and public land. It has proven to be a:

> challenge as we haven't planted a classic, arboretum … effectively we've not planted genus clusters in proximity as would be in an educational space. We were limited by space, in part, but in the planting of an urban arboretum we plant in small spaces, settings of five to six trees. … In parks we can plant pockets of genus, but in Burnley we are planting at the edges of housing estates.[22]

The Arboretum is an important case study in that it operates beyond the traditional values of their planting in urban centres encompassed by the already magnificent Towneley Hall Park, owned by Sir Simon Towneley and his family. This millennium initiative was intended to address the fissures between white and black communities and respond to the racial tensions experienced by the British Asian and British white populations. These tensions culminated in race riots in 2001 in Burnley, Oldham, and Bradford and resulted in several government reports and the setting up of the Racial Cohesion Unit.[23] In response to these events the government has opted to embrace 'cultural' solutions rather than economic fixes through infrastructural investment.

Out of the one million trees at the Arboretum, three thousand trees are officially classified as 'non-native'. These have been picked by the arboriculturalist Phil Dewhurst, through negotiation and consultation with the community. The planting of the 'non-native' species is a political move to address the arguments that are embedded in the racial narratives in Burnley over ownership and belonging to the streets of Burnley, namely arguments over 'who is native' and 'who is not'. Through the landscape of the Arboretum the power of cultural and biological discourses about native and the 'non-native' are challenged, addressed and intended to be reconciled to some degree. By the planting of the Arboretum, the racialized figure of the 'non-native' is being redrawn and reclassified through the process of incorporating landscape memory, transnational migration history and the values of nature of these British Muslims into the landscape. In essence, the Burnley Arboretum evidences the need to consider the cultural and biological conceptualizations of 'native landscape cultures' and their need to be thought through in a British cultural context, where multinational migration histories have allowed multidirectional settlement to and from the colonies.

These flows of species, and their intertwined cultures of nature, are evidenced in our physical landscape, which is a collage of native and non-native species as a result of Imperial flows of values and seeds. Mobility has been key to creating a British landscape culture that is materially a transnational, ecological space. Memories of these values, in turn, are foundational to an English landscape aesthetic, often presented as 'native'.[24] A vision of a cosmopolitan nature is materially encouraged in the Arboretum, through the planting of non-native trees (all of which were sourced in Britain); the Arboretum creates a landscape morphology which endeavours to 'civilize', educate and operate as a cultural force. It operates through material form reflecting an ideological vision of what Denis Cosgrove describes as a 'contemporary materialization of the dream of community'.[25]

The research with the British Muslim Community in Burnley was initially based in the Lake District and that led to further research in Burnley.[26] However, the Arboretum in this example is not simply an aesthetic or educational tool of improvement, but one where new civic citizenship is forged. Arboriculturalists often see trees as the solution to social and urban denudation and decline; often figured as an anti-human encroachment of non-natural cultures of living solved through a vision of 'city lungs' in the form of public spaces and public parks. In this example something quite radical is at play, an ideological vision of a cosmopolitan understanding of nature, where nature is not regarded as ideally in stasis, in root producing a common ground of historical regional or national landscape. This investigation attempted to reflect on the ways in which ecological terms such as 'native' and 'non-native' are used, to undermine a culture of the British landscape as being rooted in multinational flows and values of nature.

VISUAL METHODS: CAPTURING 'ROOTS' AND 'COMMUNITY'

The paintings shown in Plates XVII and XVIII were created as part of a visual research workshop held with members of the Burnley community, including the Burnley Asian community and Dewhurst. The research workshops aimed to gather in visual form community values of landscape as linked to senses of belonging, history and heritage. The research project entitled 'Nurturing Ecologies' was a research collaboration with Lancastrian landscape artist Graham Lowe.[27] Overall, the aim was to make tangible environmental memory in the form of over thirty canvases which captured local responses to their landscape, including Burnley and the Lake District National Park. The set of paintings was intended to enrich more ethnocentric accounts of history and landscape heritage in this region. The paintings that Lowe produced were based on visual collages,

drawings and sketches, produced by groups from Burnley that were drawing through their relationship with landscape and envisioning their idea of a Burnley landscape that embodied their 'ideal' relationship with the place (Figure 2).

The visual methodology designed for this research was an attempt to make tangible environmental memories that are significant to the communities living in the area of Lancashire and Cumbria, and their sense of Britishness. Nicholas Green has argued that landscape appreciation has operated within 'a strait-jacket which inhibits possibilities for a more effectively historical understanding of landscape'; embodied in an 'elite' cultural lens that excludes everyday experiences with landscape.[28] The design of the methodology used records the appreciation of the visual landscape from the perspective of those usually marginal to the national iconography. Working with the artist Graham Lowe allowed the opportunity to record and make tangible some 'other' narratives in a visual mode to enrich the cultural record, and thus extend the variety of landscape representations encountered in the gallery space. The production of the final paintings is part of a political process, by offering a formal site and space (of the canvas and of the gallery) they, in some small way, add a tangible means to archive both community responses and, more broadly, contribute to a fuller genealogical picture of the translocal cultural history of Britain.

Lowe took photographs and assisted others to draw and paint landscapes that they had struggled with. The sessions were tape-recorded; together these visual and aural texts formed the basis to Lowe's paintings. Forty paintings were produced over eighteen months from September 2004 to April 2006. Within this period there were four gallery exhibitions, including at the Duke's Theatre Gallery (2004); Towneley Hall Museum Gallery in Burnley; the 'Fear' conference held at the University of Durham (2005), and the Theatre by the Lake (2006), Keswick. The canvases were produced by a professional artist and then became part of the circulation of landscape values and representation within these art spaces and networks.

Figure 2. Workshop with Asian women from Burnley, 2004

Memory and heritage are central to what constitutes senses of identity and social practice that are about belonging and citizenship.[29] In the group situation the aim was to capture a set of visual vocabularies and grammars that communicated the local communities' sense of landscape heritage and belonging within a group framework:

> Groups provide individuals with frameworks within which their memories are localised and memories are localised by a kind of mapping. We situate what we recollect within mental spaces provided by the group. But these mental spaces, Halbwachs insisted, always receive support from and refer back to the material spaces that particular social groups occupy.[30]

Group and individual memories that are recorded in the workshop process are in turn embedded in the set of paintings created by Lowe. This process is an inclusive model, inclusive of mobile memories and social histories. Memories here are considered as being meaningful to processes of understanding community connections with the British landscape. The memories and biographies described in the sessions were then located in Burnley, which led to the involvement of Dewhurst, later known as 'Tree Man'. Dewhurst was the arboriculturalist for the Burnley Arboretum whose ecology is being used to challenge the seemingly insurmountable rifts between the white and Asian communities in Burnley and between the various sections of the Muslim community also. Most importantly, his vision of the urban Arboretum seeks to incorporate views of the landscape that reflect different values and memories in an attempt to visualize and materialize a landscape legacy which forms a site of belonging, enfranchisement and pride for all whom live within Burnley.

The painting 'community' (Plate XVIII) reflects the materials produced by the Burnley Muslim community. This is where feelings of being seen as 'not-belonging' and questions of 'native' and 'non-native' figure in relation to their situation in Burnley and ultimately their national landscape cultures. Notions of 'native and 'non-native' pervade the landscape of Burnley in cultural and ecological language and practices. Fear, isolation and immobility were a feature of their narratives about living in the Burnley landscape. What came through in discussions with the Burnley group, was a lack of optimism and feelings of immobility. The sessions drew out discussions of the effects of the riots in Burnley and fears about the future for the younger generation, and how their social mobility was hindered. The image 'community' garnered the visualization of an 'ideal' community site within Burnley, where religion, and community appear as positive features in the landscape. They counteract feelings of detachment and disenfranchisement. *Root* is based on Dewhurst's drawings and his vision of an ideal landscape of Burnley (Plate XVII). In this painting, Graham Lowe has reflected on landscape as spiritual and that at the heart of it is a human-centred, collective 'root' of understanding, a place in the world and identity. Both of these paintings challenge the differences and divisions that are resonant between white and black communities in Burnley.

A FUTURE FULL OF HOPE: ECOLOGICAL BRIDGE-BUILDING

The Arboretum represents the material monument to an organic cosmopolitanism reflected in Dewhurst's personal ideology. This in turn has been shaped through his experience of racial tensions in Burnley and his belief systems around human nature itself and a framework of thinking that incorporates a philosophy embedded in ecological time-lines. The Arboretum is devised and designed within these 'structures of feeling' that operate beyond narrow definitions of English landscape. It is a bridge between societies within Burnley, but also an exercise in building a bridge across separate camps of ecological

definitions of 'native' and 'non-native'.

In Burnley itself there are moves to repair tensions between 'white' and 'black' communities and to challenge the basis of racist violence which is embedded in territorial language of belonging and non-belonging. The results of these tensions were experienced by the Burnley community in the riots of 2001. There have been several government initiatives to address these rifts. There is currently an emphasis on community cohesion which is in itself problematic, in that it assumes fixed minority ethnic identities. Amin has argued that prosaic sites of cultural exchange and transformation are critical sites of challenge to the limited narrations of the 'White legacy' of national belonging in Britain.[31] Alongside prosaic sites there is a need for 'plural and contested senses of place' which contribute to the politics of ethnicity and identity (p. 959). The Burnley Millennium Arboretum initiative is a site where these come together.

Since the riots in Burnley, Oldham and Bradford the government has set up various initiatives to increase racial cohesion in the form of 'cultural' rejuvenation rather than economic investments in housing stock, infrastructures, public transport, and entrepreneurship.[32] In Danes House ward, a key site of tensions during the riots and the heart of the Asian community, there is a significant level of poor quality social housing, and decreasing levels of social and community facilities, including health, advice and educational services. Since 2001 investments have been made in setting up a community farm, allotment sites, and a health centre. In this same period local services, such as a Bangladeshi advice centre and local one-stop council advice centres, have been shut down. It is Dewhurst's vision that community cohesion can be addressed and greatly enhanced through the community planting of trees, and the physical landscape that is ultimately left as a legacy for the folk of Burnley in future centuries.

Dewhurst compared a future morphology of Burnley to the contemporary civic landscape of Oxford (the site of his previous job as an arboriculturalist). The civic pride and value of the urban landscape in Oxford for Dewhurst has a large debt to the planting practices evidenced from centuries prior to this. For him the majesty of the trees in the city of Oxford contributed to civic pride and to the social economy that is buoyed through their aesthetic presence and their cultural capital. Trees grow in different timescale, beyond the re-election schedules of local government, national government and, indeed, individual lifelines. Over time the Arboretum will provide a texture of landscape, which in scale and size will occlude the degraded urban scene that is Burnley today. Their huge presence within the landscape 'will force you to be respectful', and intrinsically through aesthetics and presence instil civic pride.[33] The new landscape envisioned, thus leads individuals to respect their environment, and enable a feeling of enfranchisement and pride, which serve to reduce tensions and consolidate social relations in the locale. Identity, community and the politics of belonging are thus addressed through the material force of the new morphology, but also through the new set of genetic properties of species planted.

In the Millennium Arboretum, the mix of 'native' and 'non-native' is reflected in this intellectual framework, but also in the aesthetic and cultural relationships that the Burnley community have with it's sites, features and textures. The planting of non-natives is a radical idea that is controversial and generally rejected within ecological thinking and policy formation. The Department of the Environment, Transport and the Regions and organizations such as English Nature have well-established policies on biological translocations, both argue with equal vehemence that:

> The invasions (of non-native species) can have serious economic and ecological consequences. The ecological cost may be the irretrievable loss of native species and ecosystems, including loss of characteristic local distinctiveness.[34]

However, in Burnley borough council debates, Dewhurst argued for and won the right to plant an arboretum that included three thousand non-native trees. He argued that the Arboretum should reflect the multicultural landscape within which they were planted. By involving both sets of communities in the planting process, Dewhurst was aiming to understand that they were building a common heritage, a heritage that is shared, but which has distinctive elements on both sides of the race divide. Dewhurst's ideological imperative reflects the fact that he contests the 'fixity' of definitions that are embodied in the philosophy of ecology embraced by agencies such as the Natural England and the Countryside Agency. For example the Joint Nature Conservation Committee advice on non-native species, is not dissimilar to the rhetoric used by far right campaigners in Burnley or Oldham in respect of the British Muslim community:

> Non-native species may displace native organisms by preying on them or out-competing them for resources such as food, space or both. In some cases this has led to the elimination of indigenous species from certain areas. Occasionally non-native species can reproduce with native species and produce hybrids, which will alter the genetic pool (a process called 'genetic pollution') which is an irreversible change.[35]

These types of discourses are deeply embedded in the ecological policy-making literatures which are defining landscape design and planting practices in public spaces, including spaces such as Burnley Parks and public space.

Dewhurst defended his position to local authority and others resistant to planting non-native species, by explaining that in his view any ecosystem has a natural equilibrium, that it will attain by ensuring an ecological mix, and through competition a natural balance will win out. For him, resistance to non-natives in ecological debates is a response to the problems of a narrow sense of 'time'. The key question is 'at what point in time do we start with our taxonomy of native species?' Also in all ecosystems, there are thousands of species that have become 'naturalized'; these are adopted species, those species seen to have now been integrated and thus now welcome to stay. This is inevitably a question when worked through that is based on a 'cultural' calculation, and not a scientific 'truth':

> We are a genus of one species with many subdivisions, there are divisions of that species that have predisposition that could prove fatal to the other subdivisions of that species – in the big picture – the exposure of that species to all there is there to be exposed to, ultimately gives it greater strength… As an individual you stand on your own two feet and are confronted with the world. And the claim that you shouldn't be there is just wrong. You might not like the fact that there are gay people or those that have a different skin colour – these are elements of the human condition but being exposed to these can only help you – that would enable us to retain integrity for the species – I would argue that this is the same for any other organism.[36]

What this statement makes clear is that by embracing an organic cosmopolitanism, new civic materialities are possible for the people of Burnley. These in turn will lead to new cultural landscapes and new civic political landscapes. Ecological bridge building however, occurs at many levels, at one level there is a legacy of multi-species heritage for the 'white' and 'black' communities, at another there are bridges built between the two separate 'Asian' groups within Burnley itself who are also divided along cultural lines.

Within the Burnley Asian community there are rifts between the Bangladeshi community and Pakistani community. Prior to partition instigated by British rule in India, both communities lived in 'India'. These communities, as a result of partition were then moved to form two nations, Pakistan and Bangladesh. Many of the Pakistani

residents are double-migrants formerly of 'Gujarat' in India (North Western province) and are now living in 'Gujarat' in Pakistan, which is part of the Himalayan foothills; their main town is Balakot, near the city of Musafrabad. Both sections of the Burnley Asian community have a common language in the form of Hindi; also they are similar in their religious practices and interpretations of the Qur'an. However, 'East' and 'West' of the community are split, namely due to a range of mountains that divide their community between Pakistan and Bangladesh.

To address these rifts Dewhurst sought to bring the community together through the tree planting sessions, where the tree called the Himalayan Birch was the main focus of events. The Himalayan Birch (*Betula utilus*), is found spread across the whole Himalayan range from Sikhim, Pakistan and across to Afghanistan. There are two types of Himalayan Birch, yet in catalogues these are often listed as having the same Latin name; however, they are different, one having a very dark brown bark and the other a pure white bark. The white bark species is found to the west of the Himalayas and the brown-barked one in the east; however pockets of either are present on each side of the mountain range. Through Dewhurst's planting projects these two different communities are brought together to discuss the tree species and many are reconnected with their landscape of the Himalayan foothills. Recognizing it from their memories of Pakistan and Bangladesh in the planting sessions, the trees bring people to talk through common cultural landscapes and in turn the parallels between the genus of tree and where their own common ecological heritage is brought to the fore. This is an example of how the classifications between 'fixed' cultures and identities linked to 'fixed' national or state boundaries is being challenged through ecological practices in Burnley.

The challenge to the bounded notions of state identities, including English, are present in these practices, but also are part of the soil and landscape systems of Burnley. Their presence is set to rework a notion of 'local' and relationships between people and place embracing a cosmopolitan approach to identity, which is a source of enfranchisement to black and white communities to the landscape. Dewhurst's 'faith' in trees created a landscape that is reflective of varied cultural heritage in the population. By orientating the landscape to connect with memories of the past, and by creating a landscape of the future, he is attempting to produce a synthesized understanding of ecological heritage, cultural heritage and a new civic citizenship based on landscape, trees and memory.

MEMORY AND COSMOPOLITAN PHILOSOPHIES OF NATURE

The Burnley Millennium Arboretum has provided some evidence of the possibilities for creating new civic materialities that address the problematics of the 'native' and 'non-native' debate in both human and natural realms. By employing a frame that embraces the politics of ecological time lines, which also links with transnational memory cultures, Dewhurst has materialized a mimetic space as a source of enfranchisement for all in the material landscape. The Millennium Arboretum recognizes that transnational memory within heritage spaces is necessary for inclusivity and politically enfranchising cultures of citizenship. The Arboretum thus exemplifies the possibilities for providing opportunities for a new cosmopolitan practice in the English landscape. As part of our cultural values of landscape, our 'task is to exploit the ambiguities embedded in landscape, as dwelling and picture, to discover ways of understanding and engaging with its varied and always rich meanings', and maybe to continually challenge and iterate plurality rather than fixity in our cultural and biological definition of 'native' landscape.[37]

Turner's main argument for a global cosmopolitanism has embedded within it a notion of reflexive distance from a 'homeland' and an ironic stance which allows a

distance from the polity. He argues that 'scepticism and distance from one's own tradition are the basis of an obligation of care and stewardship from other cultures' including diasporic cultures. They also 'require ironic membership if the modern world is to escape from the vicious cycle of ethnic conflict and retribution … characterized by cool loyalties and thin patterns of solidarity' (p. 58).[38] The extent to which the Arboretum has been made possible by Dewhurst's own cosmopolitan lens indeed has an ironic and reflexive stance, both towards membership of human and natural categories of English citizenship and landscape. However the ironic and reflexive stance embedded in the Arboretum are problematic for the Burnley Muslim communities. This is not for reasons of a fundamental relationship with Islam or a puritanical essence of community belonging, but that to acquire irony and reflexivity about membership of any diasporic citizenship group, one requires a sense of security, and a sense of hope about one's place in the world. As Graham Lowe's painting *Community* shows, these are still positioned as desires for this community.

In Britain, until diasporic communities, like the Burnley Muslim community break free from feelings of 'isolation', 'fear' and 'immobility', their sustenance, nurture and refuge remains the citizenship of their diaspora society, which has provided an anchor in their transnational status and cultural citizenship. Britishness has to some degree yet to allow them the scope to think beyond time-lines of cultural definitions of racial difference and, also, British Muslims are yet to embrace a hope of a future cosmopolitanism that enables their future social mobility and acceptance as part of modern British and indeed an international body-politic.

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FINOLA O'KANE

EDUCATING A SAPLING NATION: THE IRISH NATIONALIST ARBORETUM

Trees had an important status in Irish mythology and culture and during the period of the Arts & Crafts Movement and the Irish nationalism of the late nineteenth and early twentieth centuries they were again appropriated for nationalistic expression. This took various forms and this paper demonstrates how the Irish arboretum, as a living museum, represented many different histories and identities whilst exploiting a tradition evident in the arboreta of Glasnevin, Avondale, Sliabh Coillte and St Endas. Avondale, Co. Wexford, the state forestry school and arboretum, was created in 1906 to express a changing modern Irish identity, whilst during the 1960s another arboretum was created to the memory of former US President John F. Kennedy using American Republican Sinn Féin funds. Other nationalist arboretums also appeared, making Irish arboretums major embodiments of the constant struggle between images of nature, educational values, and political ideas that have helped to shape modern Irish cultural identities.

Samuel Hayes, author of *A Practical Treatise on Planting; and Management of Woods and Coppices* (Dublin, 1794), planted substantial woodlands at his estate of Avondale, Co. Wicklow, Ireland, in the eighteenth century.[1] Redesigned by A. C. Forbes in 1906 as a state forestry school and arboretum, Avondale has also become the state museum to nationalist icon Charles Stewart Parnell, agitator for the Irish Land League and Irish Home Rule. In the 1960s, new empires of influence and emigration saw the creation of an arboretum to the memory of John F. Kennedy in Co. Wexford, a memorial solely bought and funded by American Sinn Féin organizations. The government attempted to temper its politics by attaching it to another pedagogical initiative: a state horticultural school. An arboretum was again the memorial of choice to the nationalist icon Patrick Pearse at St Enda's, Rathfarnham, Co. Dublin, in the 1970s.

Ancient Irish mythology had an order of trees, which predated the arrival of the Normans. With the flowering of the Irish Arts & Crafts Movement and Irish nationalism in the early twentieth century, this order of plants became a vehicle of nationalist expression. This paper argues that the Irish arboretum became a politically calculated monument, whose spreading branches are laden with the wealth of cultural significance they represent. Animate museums, their constantly changing and developing contents represent many different histories and this mutable identity can salve and moderate political memory in times of stress. Arboretums such as those of Glasnevin, Avondale, Sliabh Coillte and St Enda's document, both individually and collectively, a tradition which weaves together the various strands of landscape, pedagogy, nationalism, politics, and memory.

School of Architecture, Landscape and Civil Engineering, University College, Dublin, Richview, Clonskeagh, Dublin 14, Ireland

THE POLITICS OF IRISH ARBORICULTURE

In Ireland of the sixteenth and seventeenth centuries and the widespread appropriation and redistribution of land led the dispossessed natives to associate loss of trees with loss of land. It was, perhaps, most poignantly expressed in the native Irish poem *Cill Chais*, which documented and bewailed the loss of native woodland, and ascribed national rebirth to Ireland's reforestation:

> Cad a dhéanfaimid feasta gan adhmad?
> Tá deireadh na gcoillte ar lár
> Níl trácht ar Chill Chais ná ar a teaglach
> Is ní bainfear a cling go bráth …
> Go dtógtar an baile seo ár sinsear
> Cill Chais bhreá arís go hard,
> Is go bráth nó go dtiocfaidh an díle
> Ná feictear é arís ar lár
>
> Now what will we do for timber,
> With the last of the woods laid low?
> There's no talk of Cill Chais or its household
> and its bell will be rung no more …
> that Cill Chais, the townland of our fathers,
> will rise handsome on high once more
> and till doom – or the Deluge returns –
> we'll see it no more laid low.[2]

In contrast, Ireland's new planter class linked the absence of trees to Ireland's impoverished status, thus forming an equal, if opposite, justification for her reforestation by the processes of colonization and improvement. In his *Political Anatomy of Ireland* (London, 1719), William Petty, the great planter, economist and politician, treated his subject as 'a Political Animal, who is scarce twenty years old; where the intrigue of state is not very complicate[d]'.[3] The chapter dedicated to 'the improvement of Ireland' recommended that the 'third part' of some '250,000 spare Hands'[4] he estimated existed in Ireland, principally among 'the Irish papists being about, 800,000' out of a total of 'about 1,100,000 People',[5] were available and able to plant trees. These included as many: 'fruit and timber-trees and also quick-set hedges, as being grown up, would distinguish the bounds of lands, beautify the country, shade and shelter cattel, furnish wood, fuel, timber and fruit'.[6] Private individuals were marshalled into adopting ambitious programmes of tree-planting, secure in the knowledge that they were profiting not only themselves, but also the state itself. From such traditions of improvement stemmed both the private and public arboreta of Ireland, never abandoning for long their economic, social and nationalist overtones.

Ireland is perhaps unique in having a tradition of education which is named after a landscape feature: the hedge school. The hedge schools took root at the beginning of the eighteenth century during the 'strictures of the penal laws, which forced catholic teachers to work underground'.[7] The strictures were intended to force Catholic children 'to avail themselves of the Protestant education already on offer, an education guaranteed to train them up to be loyal Protestant subjects'. Thus the underground teaching was 'done surreptitiously and schools were hidden away from the public gaze. The safest area was considered to be beneath the sunny side of a hedge, and it was from this location they derived their name'.[8] The emphasis placed by the hedge schools on classical education was 'in some instances … done to meet the practical requirements of the students' who were intended for the professions and foreign service in Catholic European countries and not their home country.[9]

In the rival Protestant charter schools, the children were set to do manual labour 'the boys in husbandry and agriculture … and the girls in knitting, spinning, dairying and domestic work'.[10] Unlike the high classical education aspired to by the hedge schools, the charter schools aspired to produce useful members of Irish society, who also knew and accepted their station in life. Practical manuals on farming, husbandry and arboriculture are rare in the lists of books used by the hedge schools, an acknowledgement of disinterest in the improvement of land by a dispossessed people. A list of textbooks used by hedge schools does, however, include a lone *An Act of Parliament for the Encouragement and Planting of Trees*, and other books containing a theory of practical education such as Jean-Jacques Rousseau's *Émile, ou de l'Education* (1762).[11]

GLASNEVIN ARBORETUM

Ireland's first public arboretum was that attached to Dublin's botanical garden at Glasnevin, laid out in eleven sections in 1796. The first and most significant section was the Hortus Linnaeensis, which was divided into three parts: The Herbaceous (Herbarium), The Shrubs (Fruticeum) and The Trees (Arboretum). The term 'publick' was significant, as in the period there was no publicly supported botanical garden in London, although the Royal Garden at Kew was 'rapidly becoming Britain's premier botanical institution'.[12] The desire for a public garden lay in its instigators' desire to educate their peers and to disseminate as widely as possible the economic and social benefits that could be wrought by improvement.

The nationalist agenda was evident in a poster produced to announce the formation of the botanic garden which emphasized that the society would 'be enabled to send persons around the kingdom [of Ireland] to explore its vegetable products, so as to form a Hortus, and a Flora Hibernus'. The design of the arboretum was described in detail and reflected the necessity of planting shelter screens in most Irish situations, and also the system of planting 'nursing' trees for their grander charges. The arboretum occupied the west and south sides of the ground in the direction of the prevailing winds, so screens were formed to provide protection for the closely mown grass and more exotic specimens at the centre. Between these the spaces were filled with fir, larch, laurel and elm for shelter, which were to be 'cut away when they come to interfere with the Linnaean plants, or are useless as nurses'.[13]

The tradition of using trees for shelter was a long-established one and avenues in Ireland were frequently flanked by additional avenues of shelter trees. When the principal trees had matured, the shelter trees were removed.[14] In 1707, when an avenue of firs was 'blasted down' at Breckdenston in north Dublin, their owner wrote that if they did not 'thrive when the shelter grows for them' he would 'change them for elms'.[15] Firs were a popular shelter species in their own right, and in 1769 the estate of Castletown near Dublin had a lime avenue[16] flanked by a hedge and a nursery screen of fir trees[17] with 'shores' or edges, which were banked and sodded.[18] The poster advertising the formation of Glasnevin reveals that they took care in the arboretum that the nurses had 'as distinct appearance as possible from the Species they are planted to protect, as deciduous for evergreens, and vice versa'. In estate plantations such advice appears to have been followed for deciduous avenues in particular. The necessity of making this distinction was probably more significant in the arboretum division of a public botanic garden, 'calculated for the scientist, the botanist, who studies the plants systematically' (Plate XIX).[19]

The Irish Tree Society was founded in 1900 by 'a few politicians … nursed in utopian dreams of an undeveloped Ireland', who only required 'the wand of an economic wizard to make its waste places bloom like a rose'.[20] The heady swells of Gaelic revivalism and

'new economics' enabled the society to bring pressure to bear on the new Department of Agriculture and Technical Instruction (1899) to do something 'to create Crown woodlands of a similar nature to those existing in Great Britain'.[21] In 1904, they purchased Avondale, an estate of 726 acres along with 3000 acres of mountainous land. The estate was the eighteenth-century home and plantation of the Irish arboriculturist Samuel Hayes, who published *A Practical Treatise on Planting and the Management of Woods and Coppices* (Dublin, 1794) as a member of the Committee of Agriculture of the Dublin Society (Figure 1). Avondale was also notable for its connection with Charles Stewart Parnell whose Protestant landlord status 'gave unique bite to his rhetorical assault upon his own class' and who 'created Westminster's first modern political party'.[22] Parnell was moulded by the Irish Land League and spent much political capital fighting for Irish Home Rule. A descendant of Samuel Hayes, it is likely that Avondale's connection to both Hayes and Parnell 'influenced its purchase by the Department'. Avondale's 3726 acres thus became the 'scene of two distinct pioneer movements in Irish tree planting, one by a private owner [Samuel Hayes], and the other by a government department'.[23]

The old Irish legal system had an order of trees which predated the arrival of the Normans. The eighth-century Bretha Comaithchesa, that portion of Brehon law translated as 'the laws of the neighbourhood' (or the community), lists twenty-eight trees and shrubs in four classes, trees and shrubs being classified in four degrees paralleling the social order. These were 'Airig Fed' – literally nobles or chieftains of woods or trees; 'Aithig fedo' – commoners or common trees; 'Fodla fedo' – the lower orders, and 'Losa Fedo' – bushes, non-persons or slaves.[24] There were seven species in each class. Nobles,

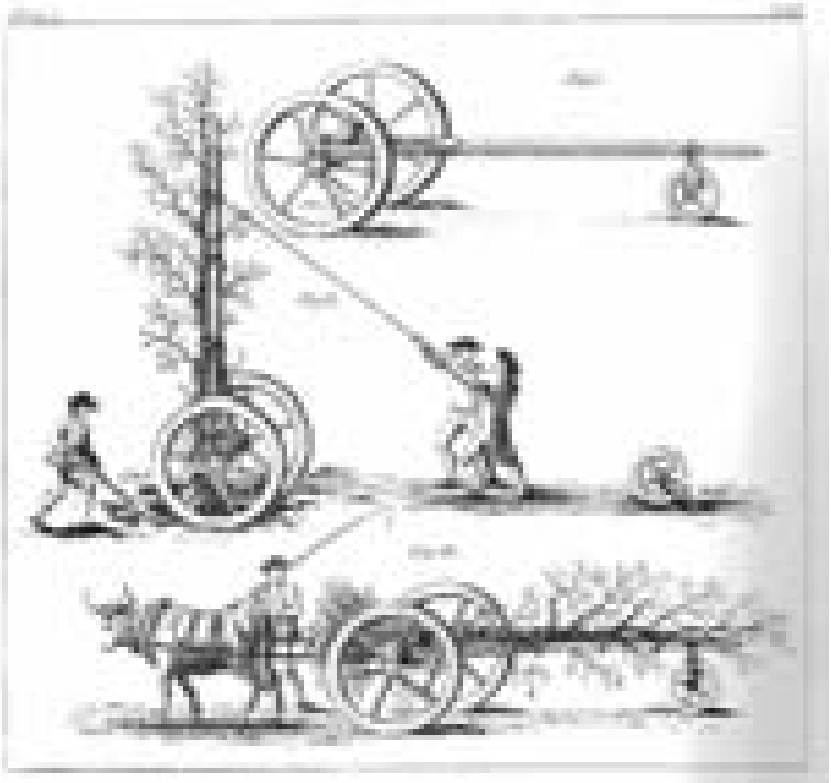

Figure 1. Tree transplanting machine; from Samuel Hayes, *Practical Treatise on Planting and the Management of Woods and Coppices* (Dublin: William Sleater, 1794), pl. 1

which included oak, hazel, holly, yew, ash pine, apple; commoners, which were alder, willow, hawthorn, rowan, birch, elm and another – possibly the wild cherry; lower orders consisting of blackthorn or sloe-bush, elder or bore-tree, white hazel, spindle tree, aspen, arbutus and crann fir, possibly juniper; and, finally, bushes or slave trees, that included bracken, bog-myrtle, furze or whin, brambles, heather, broom, gooseberry – or wild rose, opinion is divided – and ivy.[25]

A. C. Forbes was appointed Forestry Expert at Avondale and decided to create a 'forest experimental station on the lines of a Continental forest garden', for demonstration and experimental purposes, that might prove of service, not only in terms of education and training, but also by providing a resource for Irish arboriculturists to visit.[26] Forbes was interested in the Celtic order of trees and in his design for the arboretum at Avondale he laid out around 104 plots of approximately 1 acre each, planting 'various mixtures of some forty species'. Both catholic and scientific in his tastes, he included many exotic trees in the design, and the genera represented included maples, elms, beech, Spanish chestnut, hornbeam, oaks, silver firs, spruces, pines, larches, cedars, ashes, chestnut, locust trees, Douglas firs, hemlock spruces, cypresses, junipers, thuia, sequoias, cryptomeria, hickories, walnuts, London planes, tulip trees, cherries and poplars (Plate XX). The plots were laid out along a great south-east axis called the Great Ride, focused on a cairn or ancient Irish mound of stones (Figure 2).[27] This Great Ride was 60 metres wide and stretched almost 1 kilometre to the hinge of the cairn, where the axis shifts southwards to reveal a great vista of Wicklow's Avonmore River, a sight promoted in the eighteenth century by Jonathan Fisher's *Secnery of Ireland* (London, 1795) in honour of Samuel Hayes (Figure 3).[28]

A landscape design of considerable ambition and scale, Avondale's arboretum bears comparison with the later ambitious infrastructural projects of the young Irish state, the hydroelectric power station of Ardnacrusha constructed by Siemens in the late 1920s in particular (Figure 4). Sophisticated in its confident appropriation of the Baroque grand axis, Forbes reinterpreted a tradition used so effectively in Ireland at the adjacent

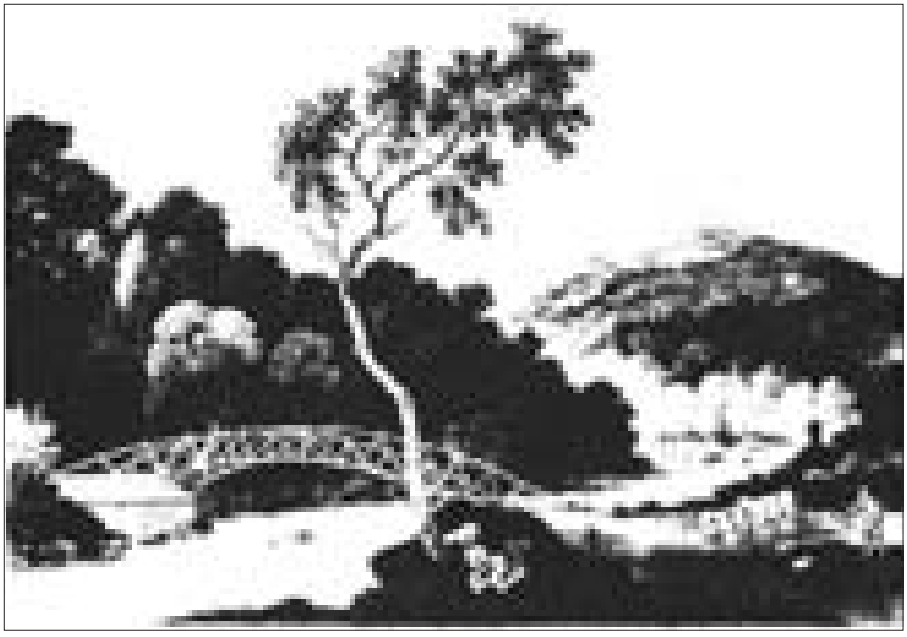

Figure 2. Hayes Bridge, on the River Avonmore, at Avondale, Co. Wicklow; from Jonathan Fisher, *Scenery of Ireland* (London: J. Debrett, 1795), pl. XVII

Figure 3. The Great Ride, 1937. Photo: Coillte

demesne of Powerscourt. A classical design intended to cultivate pride and ambition in Irish forestry, Irish foresters 'moving through Forbes' plots remember Samuel Johnson's reflection as he toured the Western isles: 'That man is little to be envied, whose patriotism would not gain force upon the plain of Marathon, or whose piety would not grow warmer among the ruins of Iona'.[29] Avondale is now owned and promoted by Coillte, a semi-state company charged with the management of the state forests, and honours two great legacies. It witnessed both the 'triumph and tragedy of one of the great leaders of our nation: Charles Stewart Parnell and formed the cradle of Irish forestry'.[30]

THE JOHN F. KENNEDY ARBORETUM

New empires of influence and emigration saw the creation of an arboretum to the memory of the late US President John F. Kennedy in Co. Wexford in the 1960s. It was controversially funded by the New York Irish Society, which was led 'in New Jersey' by 'Sean Keating, the one-time great Sinn feiner from Kanturk':

> By St Patrick's Day [1964] the New York United Irish Counties Association expects[ed] to have achieved its target of 100,000 dollars – their contribution towards the cost of the arboretum in the Kennedy memorial park planned for Slieve Coilte, outside Dunganstown, the Co. Wexford homestead of the Kennedy family.[31]

Dr E. Clarke, a journalist with the *Irish Farmers' Journal*:

> was privileged and glad to be present at the handing over to the Minister of Lands of the deeds of the estate near New Ross which is to become a living and beautiful monument to the late loved President of the United States

on the 29 August 1964.[32] Again, the idea of arboretum was combined with pedagogy and tied to a new horticultural school: 'the first in Ireland … to be established under the aegis of the Department of Agriculture'. With 'some fifty acres of land made available to go with it', the school was intended to 'fill a long and keenly felt need' as Ireland's 'success now and in the future depend[ed] squarely on education'. In 'horticultural teaching-training', Ireland 'trailed far behind the continentals and the British' and 'by comparison with Holland and Belgium', the Irish were but 'paupers'.

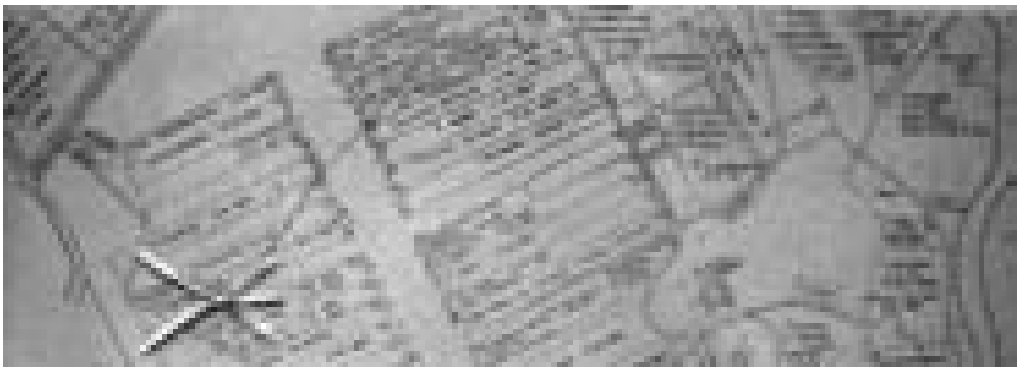

Figure 4. Detail of A. C. Forbes's layout plan for Avondale Arboretum and Forest Park. Photo: Coillte

Clarke also reported that the monument would take the form of 'a Memorial Park, having as focal points an international representative collection of trees in a great arboretum, and forest garden'. The arboretum was planned 'on a scale worthy of the great name it commemorates' to be an 'amenity of the highest order' and to 'provide interest, pleasure and beauty for the countless thousands who will tread its paths and grassy walks in the years and centuries ahead'. Again, the educational value was stressed as a 'source of endless information and challenge to students and researchers in the spheres of forestry, botany and horticulture and arboriculture'.

The 'great memorial park' was located in the area 'from which the late President Kennedy's Great Grandfather emigrated in the horrible famine days … in the shadow of Slieve Coillte (the Mountain of the Woods)'. Slieve Coillte had been 'denuded of much of its wood by the invaders [probably the Normans/English/Cromwellians] and its name had become less meaningful'. Sliabh Coillte was now 'brought into this great park scheme' and with the passing of years Clarke believed that it would regain its true meaning, but in a 'much more dignified and orderly fashion'. The report did acknowledge that the 'late President Kennedy may not have been a particular student of forestry, arboriculture or horticulture', and the suitability of an arboretum as a memorial was derived from the fact that Kennedy was 'wholeheartedly devoted to the causes of education and scientific advancement'. It emphasized that he was 'passionately for the cause of peace and friendly relations' and so the things that he strove for 'will be exemplified by the Wexford Memorial', which intended to symbolize 'science, education and friendly human endeavour', international peace, and advancing knowledge to the benefit of Ireland 'that he loved so dearly'.

Some degree of political embarrassment at the funding of the memorial by American Sinn Féin is suggested by the selection of the lowly Minister for Lands as the government's representative at the transfer of ownership ceremony. Irish officials did, however, begin to appropriate the bequest and in May three officials left for New York to announce plans for the 400-acre arboretum and forest memorial garden. *The New York Times* reported that the memorial was being 'financed by Irish-American societies', with Keating's political loyalties simplified to those of 'Sean P. Keating, New York regional director of the Post Office Department', the project being firmly administered by the Irish government. The three Irish officials were John P. Fanning, Senior Horticultural Inspector of the Irish Department of Agriculture; Dr T. J. Walsh, Director of the National Botanic Gardens, Dublin; and Anthony M. S. Hanan, Research Officer of the Forestry Division of the Department of Lands. Besides giving a press conference, they also occupied themselves inspecting US parks 'for ideas for the memorial', visiting the New York Botanical Gardens

'in their search for ideas'. The arboretum would 'contain trees from all over the world, and the forest garden … mostly of plant species from the Western United States'. *The New York Times* described the site as a 'treeless farm area called Slieve Coillte, which is Gaelic for Hill of the Wood, indicating that it was once wooded'.[33]

THE COUNTRY AND THE CITY

Ireland's *The Sunday Independent* newspaper conducted a survey of Kennedy memorials in November 1966. Cobh town's John F. Kennedy Memorial Park had just been opened and 'every spring and summer, flowers will bloom there'. Clonakilty town also provided another memorial garden and the republic's third city of Galway renamed its central and principal urban space in his honour, spending £40,000 in improving that big square of green.[34] The new name, however, never took off, and the square is still known as Eyre Square.

The newspaper continued asking 'and what of Dublin?', remembering the city where, 'in point of numbers, he received his greatest welcome in Ireland', when 'thousands cheered wildly in homage and welcome to a man who had suddenly come to personify Ireland as a nation'. The planned Kennedy Memorial Hall, which was to occupy an area of 4.5 acres, was still at the planning stage and, with the 'whip-crack from the muzzle of Oswald's rifle' predicted to 're-echo in history', the paper bewailed the fact that 'Dublin still has no memorial to John Fitzgerald Kennedy'. It did not add to the 'prestige of an Irish Government' that 'financial combines' could 'change the face of a city within two or three years, while the site for the Kennedy Memorial Hall lay untouched'. The paper suggested that it might occur to the new Taoiseach, Mr Lynch, that 'if he is to lead the country to new frontiers', he might begin with 'an act of belief in this country's ability to find £1,700,000 to commemorate John Fitzgerald Kennedy'.[35] Meanwhile, near Dunganstown, New Ross, ancestral home of the late President, the Kennedy Memorial Park was 'slowly taking shape'. Ditches had been levelled, drainage undertaken, water courses re-routed and most fencing completed. The nursery and phenological garden was partly opened and stocked, tree planting begun and a meteorological station equipped, the whole to include when complete, arboretum and forest plots.[36]

In Ireland, revolutionary movements have typically sprung from agrarian and countryside unrest. As with many colonies, the capital city was the stronghold of the 'repressing' power, which placed the city in a representative position of the status quo (unlike Paris, for example, in 1789–91). Thus, post-colonial Ireland commemorates her great men and significant histories preferably in the countryside and preferably with arboreta or cottages. Dublin never made any significant memorial to Kennedy, finding the idea of a rural and living memorial preferable and cheaper than an urban building. For example, Eamon de Valera and Patrick Pearse, both revolutionaries of the 1916 rebellion, are nationally commemorated with rural cottages, clearly identifying their ex-occupants as rural peasants (Figure 5).

PATRICK PEARSE'S ARBORETUM

It was far from such rural cottages that Patrick Pearse, who was born and bred in the city centre of Dublin to a sculptor father of English antecedents, was raised, however much he appropriated such histories in later life. A writer, pedagogue, folklorist and 1916 revolutionary, Pearse anticipated his rebellion by revisiting the tone and content of the *Cill Chais* poem:

> Ireland is passing through her third bareness, but that much of the old wood is woodland still. Dubh Chrouach and the glen beneath it & the borders of the lake that is in the middle of the glen; that much is still a Wood and will be a wood until the Day of Doom.[37]

Figure 5. Patrick Pearse's cottage in Rosmuc, Co. Galway. Photo: The Office of Public Works

A revolutionary pedagogue, Pearse set out his educational philosophy in the dramatically entitled *The Murder Machine*, a critique of the existing educational system and a manifesto for its replacement:

> And the conditions we should strive to bring about in our education system are not the conditions favourable to the rapid and cheap manufactures of ready-mades, but the conditions favourable to the growth of living organisms – the liberty and the light and the gladness of a ploughed field under spring sunshine.[38]

With this ambition he founded a bilingual school on the outskirts of Dublin where 'manual work, both indoor and outdoor' was 'part of the programme of the school'.[39] Like the hedge schools he admired, with their overtones of Plato's grove, he tried to ensure that his school was governed like a 'little child-republic' while endeavouring also to 'care for the body as well as for the mind' with 'nobly-ordered games', a 'spacious outdoor life' and daily 'intercourse with the wild things of the woods and wastes'.[40]

The house and grounds of St Enda's came into state care in 1969, having been bequeathed to the state by the Pearse family: the school had closed in 1935. The landscape architect Sidney Mascall oversaw the conversion of the run-down demesne into a public park in the late 1970s, and in 1977 it was decided to commemorate Pearse with an arboretum. Mascall carefully differentiated between native and naturalized trees in his design, perhaps echoing the political tone of the time. For example, he included oak, ash, birch and alder as native trees and willow, pine, beech, sycamore and sweet chestnut as naturalized examples. A pergola, the garden structure particularly popularized by Edwin Lutyens (not least in Ireland at Heywood and Lambay), was constructed beside the arboretum of native trees. The irony of this marriage appears to have escaped the civil servants who put the design in place. Alternatively, these mixed metaphors may reflect the particular difficulty of representing Ireland's past in the politically charged atmosphere of 1970s Ireland, when the Troubles in Northern Ireland erupted onto the world stage.

CONCLUSION: IRELAND'S EDUCATIONAL LANDSCAPE

Ireland's collective subconscious agrees with Engels that the country 'was intended by providence as a grazing land'.[41] In the shadow of dispossession the hedge school clung to a boundary wall and rejected the improvement of an entire countryside. Better to prepare children for a life abroad than the environmental reality that surrounded them. The pedagogy of the hedge school also promoted a confessional characterization of landscape. Improvement, arboriculture and farming knowledge were located in the charter schools and, therefore, for Protestants. Many of the mature exotic trees, which now stand in the Irish landscape, are remnants of the Anglo-Irish commitment to arboriculture, most particularly evident in the making of the great private arboretums of Collon, Fota, and Castlewellan. Only with the reversion of interest engendered by the great transfers of land to small farmers by the Wyndham Acts and Land Commission initiatives in the early twentieth century, did the vast majority of Ireland's rural inhabitants begin to engage once again with concepts of improvement.

Education has a profound effect on the manner in which people engage with the environment in which they live. Arboretums express the link between education and the natural world in a particularly potent manner. As an ordered group of trees they, like botanical gardens, always have an educational agenda. When this coincides with the re-ordering of a nation they become powerful symbols. This power is both tempered and concealed by their character as living entities, unlike a built memorial, or at times, the built environment of the city.

Ireland has retained a mentality of dispossession regarding the landscape she now orders and recreates. The schism established by the hedge schools between the useful and the intellectual has cast a long shadow over the interpretation and reuse of the Irish landscape. Her national parks are national by default, the bulk of them having been donated to the state by wealthy foreigners, and the Irish state needled into declaring them a national park. Little of national pride and identity is associated with their growth, more a backhanded gesture to accepted international practice. No publications of note describe their creation and the state websites, dedicated to communicating their intention and remit, are more concerned with reassuring the property-conscious Irish public that the government has never used compulsory purchase orders to amass these great institutions.[42]

Trees in Ireland have always had layered associations. Such associations are, however, muted by their being 'natural' and by extension 'rural' objects. This stands in contrast to architectural objects, which suffered from a more straightforward association with Ireland's colonial past, particularly in Georgian Dublin of the 1960s. As we have seen, the Irish arboretum has become of great political significance, representing a wealth of cultural meanings. Simultaneously intertwining multiple histories, memories and mutable identities, the trees offer comfort and shelter against political storms. Ireland is however, no longer a country of poverty, rural dispossession and radical politics. Her modern landscapes are afflicted with gestures of compromise and apathy. Visionaries of the likes of Hayes, Forbes and Pearse are true exotics in Ireland's twenty-first century environment. Yet perhaps the key for Ireland's landscape future lies again in education; arboreta are living teachers and that ability is not insignificant.

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[13] Public Record Office of Northern Ireland, Foster/Massereene Papers D 562/7829C: poster announcing the formation of a botanic garden; also repr. in Nelson and McCracken, *Brightest Jewel*, p. 47.

[14] National Library of Ireland, Clements MSS, P.3752: R. Molesworth to L. Molesworth (18 November 1710): 'I hope I shall find the holes in the great avenues quite levelled where the fir trees grew upon hillocks'. Planting them on hillocks may have been intended to speed up and improve their growth and habit, as John Claudius Loudon was to suggest in the Victorian era. Alternatively, the hillocks suggest the creation of a ditch or boundary.

[15] Ibid. (12 April 1707). For a complete discussion of Robert Molesworth's tree-planting practice, see Finola O'Kane, *Landscape Design in Eighteenth-century Ireland; Mixing Foreign Trees with the Natives* (Cork: Cork University Press, 2004), ch. 1.

[16] Irish Architectural Archive, Castletown MSS Castletown Account Book 1767–75, Bryan Kavanagh's account (15 September 1770): 'To levelling part of the Left hand side of the avenue leading to Celbridge, under the lime trees containing 66P @ 3?s a perch running measure'.

[17] Ibid. (31 October 1770): 'To levelling under the trees on the R.H.S. of the avenue leading to Celbridge, stubbing the firr trees, cutting the hedge and fagotting'.

[18] Ibid. (10 August 1770): 'To banking and sodding the sides of the Road in the Avenue to Celbridge, 120P, to making 2 Shores on the side of do'.

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[22] Roy Foster, *The Oxford History of Modern Ireland* (Oxford: Oxford University Press, 1989), pp. 180–1.

[23] Forbes, 'Tree planting in Ireland during four centuries', p. 192.

[24] Neeson, *Irish Forestry*, p. 28.

[25] Ibid., p. 28.

[26] Ibid., p. 125, n. 30; A. C. Forbes, 'Some legendary and historical references to Irish woods and their significance', *Proceedings of the Royal Irish Academy*, 41 (1932).

[27] Forbes, 'Tree planting in Ireland', p. 192.

[28] Jonathan Fisher, *Scenery of Ireland* (London: J. Debrett, 1795), pl. XVII: '*Hayes Bridge, on the River Avonmore, at Avondale, Co. Wicklow*'.

[29] Niall O'Carroll, *Forestry in Ireland: A Concise History* (Dublin: Coford, 2004), p. 24.

[30] *Avondale House and Forest Park; A Guide to the Forest Park* [brochure] (Coillte). (Coillte purchased Avondale in 2006.)

[31] *The Sunday Independent* (2 February 1964), p. 15.

[32] *Irish Farmers' Journal* (1 August 1964), p. 29.

[33] *The New York Times* (26 May 1964), p. 34.

[34] *The Sunday Independent* (20 November 1966), p. 2.

[35] Ibid.

[36] Ibid.

[37] Patrick Pearse, '*The Wood*', in Seamus O'Buachalla (ed.), *The Literary Writings of Patrick Pearse* (Cork: Mercier, 1979), p. 137.

[38] Patrick Pearse, '*The Murder Machine II*', in Pronsias Mac Aonghusa and Liam Ó Réagáin (eds), *The Best of Pearse* (Cork: Mercier, 1967), p. 34.

[39] For the history of St Enda's landscape design, see Finola O'Kane, 'Nurturing a revolution – Patrick Pearse's school garden at St. Enda's, Rathfarnham, Co. Dublin, Ireland', *Garden History*, 28(1) (2000), pp. 73–87.

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[41] Frederick Engels and Karl Marx, *Marx Engels; Ireland and the Irish Question*, 4th edn (Moscow: Progress, 1986), p. 374.

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THOMAS J. SCHLERETH

EARLY NORTH AMERICAN ARBORETA

This paper presents an overview of the historical development (1740–1850) of several North American arboreta, including William Hamilton's well-known 'Woodlands' estate arboretum on the Schuykill River outside Philadelphia, Pennsylvania; and Andre and Francois Michaux's nursery arboreta at Charleston, South Carolina, and Bergen, New Jersey, as well as their roles introducing ligneous plants into France, and the publication of Francois Michaux's North American Sylva *and his establishment of the Arboretum D'Harcourt in France. Also interpreted are several sites founded by English Quaker families (the Bartrams, the Marshalls, the Copes, and the Pierces), plus the role of British landscape architect William Carvill in his imaginative design (1835) of the arboretum campus of Haverford College at Haverford, Pennsylvania. The paper concludes with an analysis of Andrew Jackson Downing's proposals for an arboretum in the Boston Public Garden and his master plan (1851) for a national arboretum in Washington, DC, which would be subdivided into six landscapes (President's Park; Monument Park; Winter Garden; a Gothic Garden to surround James Renwick's Gothic Smithsonian Building; a formal Fountain/Lake Garden; and a new planting around the US Botanical Garden).*

America is rich in botany, especially trees.[1]

The early history of the Haverford College Arboretum, founded outside Philadelphia, Pennsylvania, in 1835, provides a succinct context to six interpretative themes that also characterize the development of North American arboreta, 1700–1850. First, Haverford (Figure 1) was envisioned as a designed arboretum[2] that would be part of the college's overall landscape architecture; second, it represents an arboretum type – the rural, planned, and residential campus arboretum – that became a popular and influential model in both Canadian and American institutions of higher learning;[3] third, Haverford was part of the first arboricultural hearth, the Mid-Atlantic/Delaware River Valley Region (Figure 2);[4] fourth, it illustrates the early dependence of many North American arboreta founded in the early nineteenth century on European, particularly British, horticultural practices, publications and, in the case of Haverford, personnel; fifth, the college arboretum was an early participant in a trans-Atlantic network of largely Quaker (Society of Friends) institutions and individuals engaged in personal and professional botanizing;[5] finally, and perhaps most importantly, the Haverford Arboretum, like so many of the continent's early arboreta, was a landscape usually accessible to the general public but one maintained and governed as a private institution.[6]

COLLEGIATE COPSES

In 1831 a group of prominent New York and Philadelphia Welsh Quaker families purchased 198.5 acres of land within a 40,000-acre tract originally ceded to their

Department of American Studies, Department of History, University of Notre Dame, 271 Decio Faculty Hall, Notre Dame, IN 46556, USA

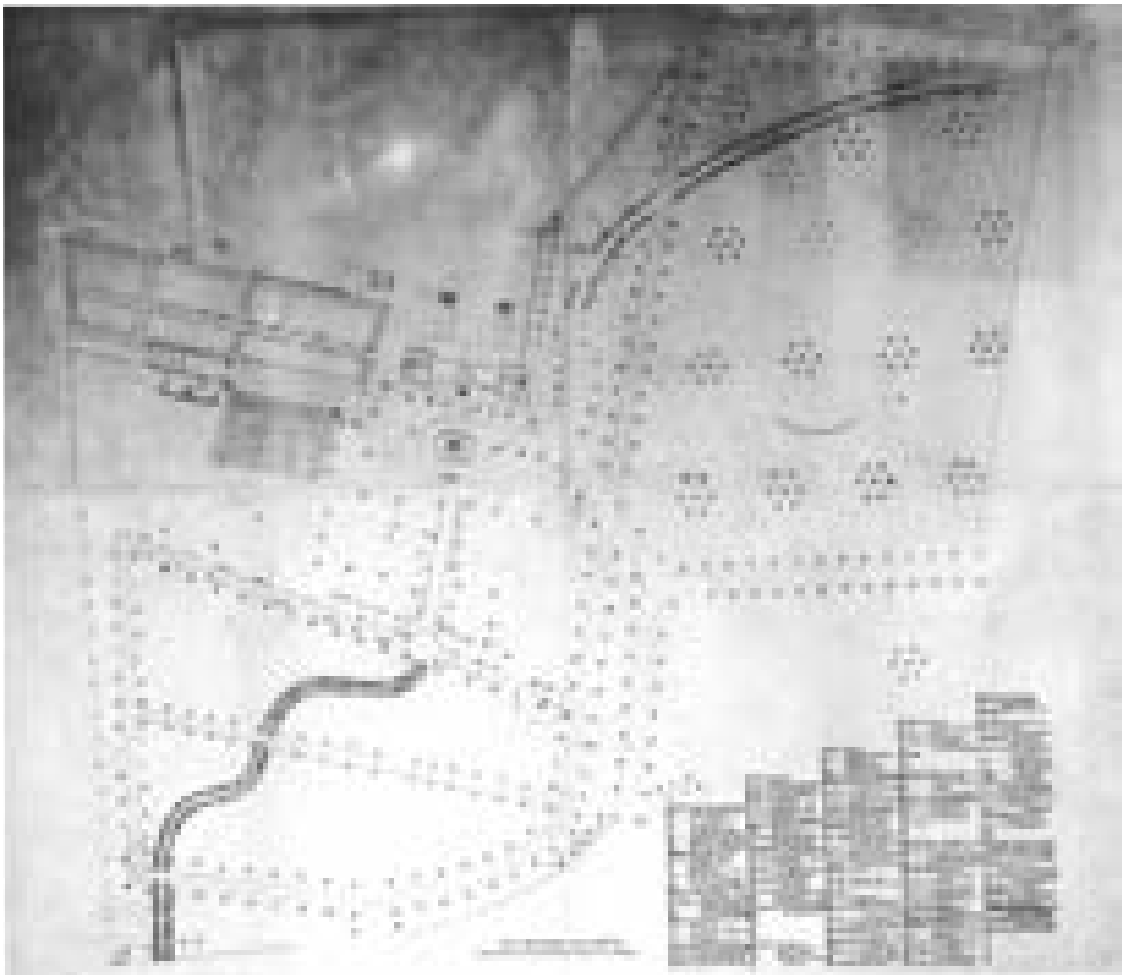


Figure 1. William Carvill, *The Plan of Haverford College Grounds and Arboretum* (1835). Courtesy: Haverford College Library, Department of Special Collections

ancestors by William Penn in the late seventeenth century. Two years later, Haverford College was founded and William Carvill, an English landscape gardener, was recruited to come to Pennsylvania and prepare a master plan for the institution's campus. While little is known of Carvill's English landscape practice, he took the work of the landscape gardener Humphry Repton (1752–1818) as a model.[7]

Carvill's original 1834 master plan (Figure 1) survives and demonstrates how he went about converting a farmland countryside into a collegiate campus and arboretum. First, he located the college's main building (as would a landscape architect designing an estate) on the campus's highest elevation as a focal point of a spacious lawn. Carvill then organized the campus into a series of avenues, roads and lanes – some formal, some serpentine – within the whole of the property. Most of these circulation routes served as *allées*, some being planted single row (e.g. sugar maples on College Lane); double (e.g. American sycamores paralleled by European lindens); and mixed rows (e.g. pin oak, bald cypress, honey locust, European beech). The intersections of campus crossroads were announced by clusters of conifers, eastern white pine (*Pinus strobus*) being Carvill's favourite, but he also used Canadian hemlock (*Tsuga canadensis*) and American larch

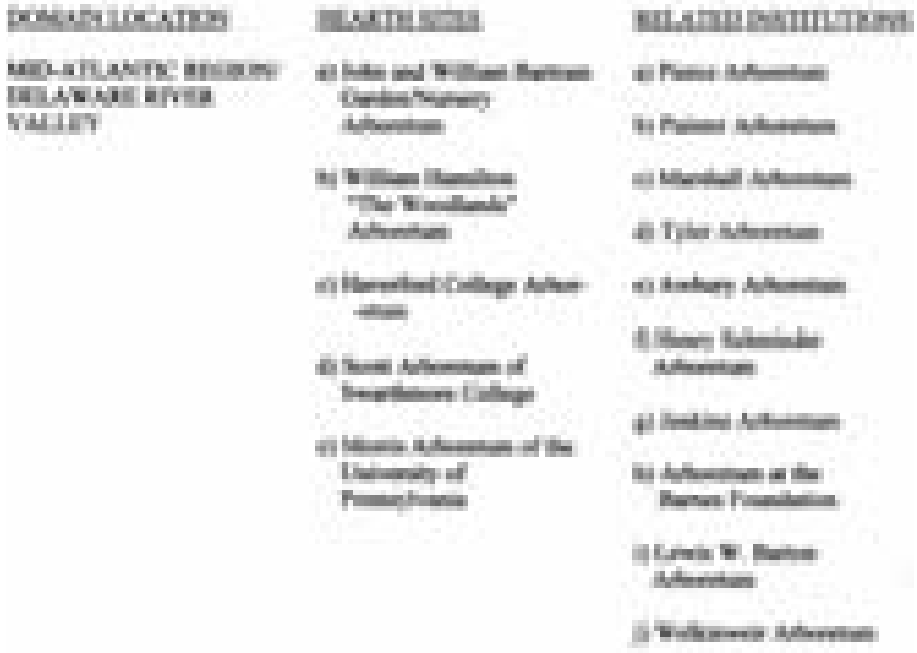


Figure 2. Arboricultural hearths/domains: cultural geography for the Mid-Atlantic Region/ Delaware Valley Arboricultural Hearth. Source: author, 2007

(*Larix laricina*). Carvell left a buffer of woods and fields as natural areas encircling the arboretum.

West of the College's Founders Hall, Carvill created a horticultural complex that included the campus kitchen gardens, lined out nursery stock, and propagating glasshouses. He continued to work here and in the arboretum until 1845 when, due to financial difficulties, the college closed for three years. He then sought work in Philadelphia. A fragment of the original greenhouses was salvaged and restored in 1900 and this may be the earliest public memorial to a North American landscape architect. If not, Carvill is also popularly well known for introducing both cricket and rugby to Haverford undergraduates, and hence to North America.

While he envisioned the college's entire campus ultimately as an arboretum – a tradition followed at other Quaker institutions such as Swarthmore – he also contributed a distinctive, albeit simple, design formula for the great expanse of open land that sloped eastward from Founders Hall to the Duck Pond. Here, in fifteen group plantings, each of an identical tree species, he left an enduring arboreal and cultural statement. First, his planted copses were primarily North American species. Second, they were generously spaced, allowing ample room to view them distinctly from a distance. Third, and most significant, their arrangement symbolized two important religious tenets of the Society of Friends: individual belief and community cohesion. To demonstrate these precepts, Carvill planted six of a tree species, as in, for example, the Tulip tree cluster, in a circle to symbolize the Quaker faith in community. Within this circular embrace of trees, he planted a single specimen, an iconic tree to stand for the individual Friend as believer. While the original complete set of copses no longer exists, new plantings of the clusters continue on the modern campus.

The Haverford campus is also home to a scion descendent of a famous American witness tree, the Kensington Elm (*Ulmus americana*) in colonial Philadelphia, and under

which (Figure 3) William Penn is said to have negotiated a treaty of friendship with the region's First Peoples. In 1944, the Bowman's Hill Wildflower Preserve (Bucks County, Pennsylvania) also honoured Penn by creating a 9-acre arboretum at the entrance to their site. They named it Penn's Wood, or Pennsylvania.[8]

THE WOODLANDS ON THE SCHUYLKILL

Although on opposite sides during the American War for Independence, William Hamilton (1749–1813) and Thomas Jefferson were avid gardeners. They corresponded on many mutual botanical interests, beginning in the 1790s when Jefferson was US Secretary of State.[9] Like Jefferson, Hamilton toured European gardens to import the latest plant discoveries and landscape ideas for his 600-acre estate, named 'The Woodlands' and located on the Schuylkill River, outside Philadelphia. Hamilton's property abutted the John Bartram family farm, tree nursery and horticultural business. After touring Hamilton's endless plant collections, ranges of glasshouses, lined out trees and shrubs, plus a neo-Palladian Villa that might have reminded Jefferson of his own Monticello and which survives within the precincts of urban Philadelphia Woodland Cemetery, Jefferson proclaimed that The Woodlands (Figure 4) was the only American garden that rivalled those in the Reptonian style in Great Britain. As President, Jefferson so appreciated Hamilton's reputation as a naturalist, plant collector, and landscape designer, that he shared with him some of 'the botanical fruits' of the Lewis and Clark Expedition of 1804–06. In turn, Hamilton provided the President with a mimosa or silk tree (*Albizia julibrissin*) and a sweet wattle (*Acacia farnesiana*).[10]

Hamilton's 100-acre 'parke', despite its botanical bounty, was not a unified or particularly creative overall design. What drew comment and admiration from visitors

Figure 3. Benjamin West, *Penn's Treaty With the Indians (1771–1772)*. Courtesy: The Joseph Harrison Jr Collection, Pennsylvania Academy of the Fine Arts

Figure 4. Two views (*c.*1780–1910) of the Woodland's, an estate arboretum of William Hamilton (1745–1813) on the Schuykill River near Philadelphia: (top) William Birch's painting *View of The Woodlands (1789–88)*, from Alice Lockwood, *Gardens of the Colony and the State* (Philadelphia: Scribner, 1932), I, p. 348; (bottom) Architect William Strickland's drawing of William Hamilton's 'Woodlands' in 1854 as reprinted in *Gleason's Pictorial Drawingroom Companion*, Vol. 6

and plantsmen was Hamilton's enormous 'collection' of plants from around the world. He once boasted to Manasseh Cutler and Timothy Pickering in 1803 that 'there was not a rare plant in Europe, Asia, Africa, from China and the islands in the South Seas of which, he had an account, which he had not procured'.[11]

Hamilton was North America's most serious gentry plant collector in the eighteenth century.[12] Four species that he either introduced or was the first to grow in North America have particular interest in arboreta history. Three of them – a maple, a tree-of-heaven and an Italian poplar – turned out to be trees quite different from the expectations of Philip

Miller of the Chelsea Physic Garden, who first shared them with Hamilton. The most novel, and still widely planted, the ginkgo (*Ginkgo biloba*), or silver apricot as it was known in its native China, remained a scientific curiosity in the late eighteenth century, but has become an important urban street tree in the twentieth;[13] the Norway maple (*Acer platanoides*), however, has naturalized throughout much of north-east America so the species is being cut down in some of the region's arboreta; the invasive tree-of-heaven (*Ailanthus altissima*) continues as the ultimate 'urban trash tree' but remains a major, somewhat heroic, symbol in Betty Smith's novel, *A Tree Grows in Brooklyn* (London, 1951);[14] and, finally, the Lombardy poplar (*Populus nigra* 'Italica'), the most popular tree in both the public and private North American landscapes (Figure 5) during first half of the nineteenth century, has been superseded by numerous hybrids and clones.

Given Hamilton's enormous array of ligneous plants, can we call The Woodlands, an early private arboretum? Can we say the same for Hamilton's immediate neighbour, the Bartram family's horticultural compound? Regarding the Bartram site, Richard Campana considers it as the paramount garden and arboretum nursery in the Mid-Atlantic/Delaware Valley arboricultural hearth. Penelope Hobhouse, in *Plants in Garden History* (London, 1992), identifies Bartram 'in his arboretum', where 'he sited plants carefully according to their ecological needs'.[15] Campana emphatically sees The Woodlands as 'a private arboretum'. Therese O'Malley includes it among her survey of 'early botanic gardens' that 'were arranged in systematic fashion for botanical study', but were 'also notable because they displayed their scientific character within artistic designs of the highest quality'. The Woodlands, she concludes 'exemplified the latest advances in botanical sciences and taste in landscape design'.[16]

Stephen Spongberg considers Hamilton's arboretum as 'the largest collection of foreign shade and fruit trees in the young nation'.[17] Most visitors of the era would have

Figure 5. Thomas Jefferson suggested a double *allée* of Lombardy or Italian poplars lining Pennsylvania Avenue in Washington, DC, from the President's House to the US Capitol (1822); from Charles Burton, *View of the Capitol, Washington, D.C. in 1814*, watercolour. Courtesy: The Metropolitan Museum of Art, New York

agreed with Francois André Michaux's similar assessment of Hamilton's plantings in 1805: 'All the trees and shrubs of the United States, at least those which can support the winter in the open air at Philadelphia are distributed among the groves of an English garden'. Frederick Pursh, writing a decade later and recalling his work there, noted that The Woodlands's collections were so comprehensive that when Michaux's '*Flora Boreali-Americana* appeared … I was not only in possession of most of his plants, but had then a considerable number not described by him'.[18] The Woodlands's credentials to be considered as a private arboretum are ample: it was a site for teaching science, landscape architecture, plant introduction; it also had a modest botanical library and a beginning herbarium. Benjamin Barton Smith brought his students from the University of Pennsylvania to botanize in its collections.

A SYLVA AND AN ARBORETUM D'HARCOURT

William Hamilton was well acquainted with André Michaux and his son Francois, two French naturalists who explored North America beginning in 1785. Both were often compared with John and William Bartram. André, like John, was a born itinerant, a doer rather than a writer. Francois, like William, while a plant explorer, became best known for his published achievements. The younger Michaux both edited two of his father's works and wrote several botanical books of his own, the most famous being his *North American Sylva*.[19]

Accompanying André on their first North American expedition, Francois was in charge of a research nursery arboretum that the team established near Charleston, South Carolina. Their objective was to grow on new North American genera to introduce to France, as well as be the southern *entropôt* for acclimatizing and, ultimately, introducing European plants to North America. A similar arboretum nursery was begun at Bergen, New Jersey. After his father's death in 1801, Francois returned to America on two major collecting journeys (1802 and 1806–08). Back in France, he prepared a planter's guide to growing North American trees in France and an account of his own botanical travels in eastern North America, where he completed his major survey of the continent's trees, *Historie des arbres forestiers de l'Amerique septentrionale* (1810–13).

In 1828 F. A. Michaux accepted the directorship of an estate, Harcourt in Normandy. There he established the Forêt et Arboretum d'Harcourt, 'the first of France, which today displays' temperate zone forest trees collected from all the continents except Australia.[20] In addition to the legacy of Harcourt and his publications, Michaux also underwrote North American tree research by providing monetary support to the American Philosophical Society and the Massachusetts Society for the Promotion of Agriculture, as well as individual researchers such as Harvard taxonomist, Asa Gray. In 1953, two years before the centenary of his birth, a memorial grove, the Quercetum Michaux, was planted at the Morris Arboretum of the University of Pennsylvania.

QUAKER FAMILY ARBORETA

Thomas Pym Cope Sr (1768–1854), a successful Philadelphia Quaker shipping magnate, along with the American novelist Charles Brocken Brown, visiting The Woodlands in 1805, found William Hamilton's garden 'unquestionably the richest in the variety and value of its plants and in the taste displayed in their arrangement of any in this state or perhaps in the United States'.[21] Cope's grandsons, Thomas P. Cope, Jr and Francis Reeve Cope, developed a suburban family compound (Figure 6) in East Germantown, then outside Philadelphia. The site eventually evolved into what became the Awbury Arboretum by 1918. While its beginnings were mid-nineteenth century, it can be considered as a later

development of the Mid-Atlantic/Delaware River Valley arboricultural hearth (Figure 1). Similarly, Quaker in ancestry, the Cope families were connected with Swarthmore and Haverford college arboreta. The name Awbury, derives from Avebury in Wiltshire, England – the ancestral village of Oliver Cope who first secured the site from William Penn in 1681.

Initially, Awbury in Pennsylvania was a summer estate for the families of Henry Cope and his two sons. Eventually, it became a year-round residence for these families, their extensive kinfolk and private individuals wishing acreage and arbour in a suburban setting. Many of these properties still serve as private residences within the original Cope land grant, giving the modern arboretum a distinctive, collective ownership. In the estimate of one of its early site managers, it is a mini-suburb arboretum (not unlike the housing design that Andrew Jackson Davis would implement at Llewellyn Park in West Orange, New Jersey (see below) (Figure 10):

> a unique example of a 19-century family-enclave still alive in its natural setting. There were no fences between houses: privacy was achieved through the use of vegetation that conformed to the English-style landscape of the estate, and the large open areas were held in common by all.[22]

Thomas Cope, the elder of the Cope brothers and an amateur naturalist, commissioned William Saunders (1822–1900) in 1862 to prepare a master plan for

Figure 6. The Francis Cope House (1862), currently serving as the administration building for the arboretum staff offices and its education department. Photo: Awbury Arboretum Archives, *c*.2000

the grounds. A Scottish gardener trained at the Royal Botanic Gardens Kew, Saunders came to Philadelphia in 1848, establishing a partnership nursery with Thomas Meeham that specialized in native plants. He later designed the National Cemetery at Gettysburg (which included an arboretum) and the newly created US Department of Agriculture arboretum on the National Mall in Washington, DC. In his private commission for the Cope arboretum, Saunders took the English private park as his design model creating long vistas framed by copses of trees and shrubs, punctuated by rolling lawns and ample open spaces.[23] This once suburban (now totally urban) arboretum is the result of the largesse of two women: Annette and Caroline Cope. Beginning in 1916, they jointly bequeathed their landed and monetary inheritance to 'suitable societies for forming or improving public parks and pleasure grounds or preventing the destruction of trees and green plants'.[24] Their intent was to preserve and maintain a 'public arboretum for the cultivation and study of trees and flowers and as a refuge for migratory birds'. Their decision was not singular in early twentieth-century North American arboreta history. Between 1915 and 1935, eleven private arboreta became public through a variety of legal arrangements whereby their sites became non-profit organizations, university affiliated, or municipal, county, or state institutions.[25]

While not as grandiose as The Woodlands, the 30-acre farm in East Malborough, Pennsylvania, of two Quaker twin brothers Josuha and Samuel Pierce, has an interesting and lengthy role in the history of North American arboreta. Their ancestors, like the Bartrams, the Marshalls, and the Copes, received their land grant from William Penn. The Pierces prowled the countryside for new native specimens; like George Washington, they also ordered some of their exotics from the William Prince nursery arboretum on Long Island, New York. Humphrey Marshall and his nephew appear to have been botanical advisors.[26] Praise for the diversity of their collection came from Andrew J. Downing's *The Horticulturist*, naturalists such as William Darlington, Thomas Meehan, and Josiah Hoopes, author of *The Book of Evergreens* (New York, 1868), the first published book on American conifers.[27] However, the ligneous plants they grew were not novel. Nor was their landscape design. In the latter case, the Pierces planted their trees, not unlike the Bartram's 5-acre home garden,[28] in traditional rows which they sometimes called 'double avenues', suggesting *allées*, and at other times, 'files of trees', evoking classification. Lombardy poplars, still the rage of the age, were arranged, as a double corridor, in the centre of the arboretum.

George Pierce, Josuha's son, embellished the arboretum with a variety of recreational and horticultural amenities that made it a favourite picnic and social gathering site. Inasmuch as several North American arboreta in the twentieth century began to think of their properties also as places of natural recreation (e.g. hiking, fishing, cross-country skiing), George was ahead of his time.[29] Besides the croquet lawn (for which George personally lathed the balls out of blocks of boxwood growing in the arboretum), there was boathouse, a mineral museum, summer pavilion, and rustic houses furnished with lounges and garden furniture.

The plant collection was devastated by an autumn storm in 1878 and upon bachelor George's death, two years later, he left the property in equal shares to the nine children of his sister. Between 1905 and 1906, the park arboretum changed owners three times, the last owner deciding to sell the best timber to a sawmill. Pierre Dupont, who would later found Longwood Gardens on part of the Pierce arboretum property, learned of the impending felling and consequently bought the park. The Pierce landscape continued as a private enclave of Pierre Dupont until 1924 when it opened as a public garden which contained (Figure 7) some of the surviving Peirce trees. A tree-keeper in a double sense,

Dupont rescued the remnant of a private arboretum turned public park, used it for a time as a private retreat, and then developed it into one of North America's outstanding display gardens which, appropriately, has its own small arboretum.[30]

AN AMERICAN LOUDON

Andrew Jackson Downing, landscape architect, garden designer and cultural commentator, was strongly influenced by John Claudius Loudon. The men had much in common. Both were prodigies, polymaths and populists. Both designed arboreta. Each practised architecture and landscape architecture, popularized horticulture and arboriculture, and promoted new contemporary landscapes such as rural garden cemeteries, public urban parks and suburban residences. Both wrote popular (in both meanings) surveys of early nineteenth-century gardening theory and practice; founded influential horticultural periodicals; and supported the publications of their botanically talented wives. Each, in their own way, championed Humphry Repton's general landscape principles, were indebted to and contributed to the Anglo-American 'English' landscape garden tradition, and, in turn, became gardening gurus in their time. Advocates of the picturesque and its subspecies, the gardenesque; each, interestingly, is memorialized by a classical funerary urn in their respective homelands.[31]

There were, of course, differences – age being one. Loudon, a Scot, was born in 1783, the year the American War for Independence from the British Empire ended. Downing (Figure 8), of English ancestry, was born in 1815, the year the second war with Great Britain concluded. (Downing was named after the American hero of the Battle of New Orleans.) Hence, while contemporaries for a brief time, Downing always saw Loudon as friend and mentor. Loudon enjoyed a prolific sixty-year career; Downing died, at age thirty-six, in a tragic Hudson River steamboat explosion and fire off Staten Island, New York. Loudon had deeper interests and knowledge in scientific botany; Downing a more self-trained eye for the aesthetics of a landscape. While each was initially an

Figure 7. A planting of extant trees from the Pierce Arboretum now part of Longwood Gardens. Courtesy: Longwood Gardens Archives

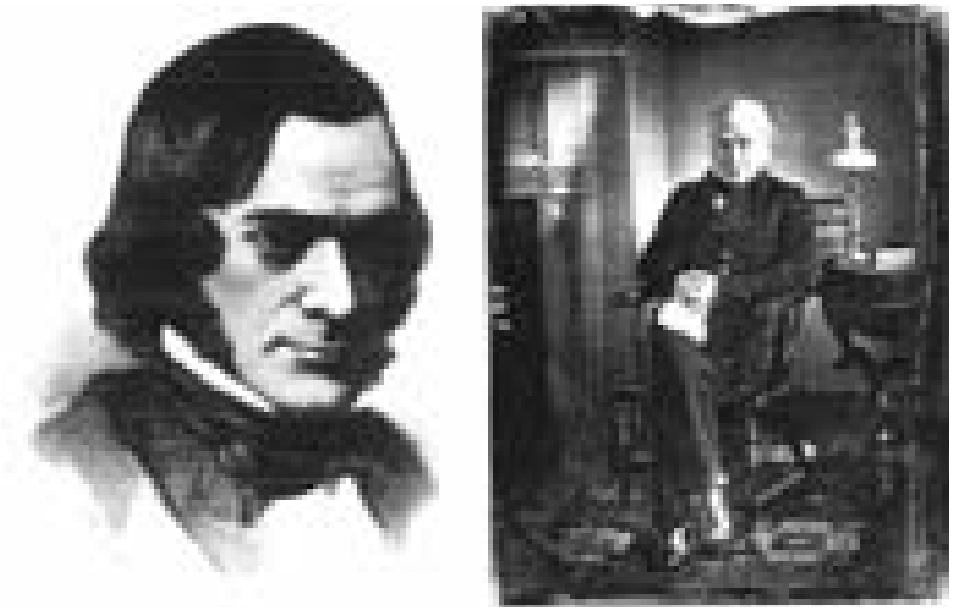


Figure 8. (left) Photographic portrait of Andrew Jackson Downing, from *The Horticulturist* (November 1852), frontispiece; (right) Philip Haas, *John Quincy Adams* (1853), daguerreotype photograph. Courtesy: Metropolitan Museum of Art, New York City

advocate of both indigenous and imported plantings, Downing, later in life, began to champion natives over exotics. Downing's horticultural headquarters at Newburg, New York – coupled with Henry Winthrop Sargent's private arboretum across the river at Wodenethe – served, as did the Hudson River, as a second North American arboricultural hearth (Figure 9).

In 1800, the Gothic Revival houses and the picturesque grounds dotted along the Hudson might also be considered as both a cultural manifestation and an elongated, riverine suburb of New York City. In that year, Nathaniel Willis, one of its residents who lived at Idlewild, New York, is usually credited with using the term 'suburb' for the first time in American parlance.[32] While historians argue about where the first North American suburb was developed – Brooklyn Heights, outland Boston, Staten Island or the Hudson Valley – many consider Llewellyn Park in West Orange, New Jersey, a site designed by Downing's frequent collaborator, Andrew Jackson Davis, and financed by a former Downing client, Llewellyn S. Haskell, as the continent's earliest, completely planned subdivision (Figure 10). In David Schuyler's estimate, Llewellyn Park closely resembled an ideal suburban community that Downing had described in an 1850 essay on 'Our Country Villages' published in *The Horticulturist and Journal of Rural Art and Rural Taste*. The site possessed, in Schuyler's interpretation, all the features of nineteenth-century suburban communities: a name from nature, entrance gates, unfenced individual property lots, a serpentine circulation system with carriageways and walks also labelled with natural nomenclature.[33] The principal cultural feature was a centrally located park arboretum of fifty acres, known as the Ramble. Here were ornamental structures such as kiosks, summerhouses, rustic seats, a wigwam, a children's playground, a Social Circle, and a Chautauqua ground.[34] In short, it was a (planned and planted) residential compound that also included a Lyceum and a Prospect Tower, plus a cascade, loch, ravine and spring. Encircling the Ramble were more arboreal plantings of clumped conifers, hickories, chestnuts and oaks. To be sure, Llewellyn Park was a private enclave for the

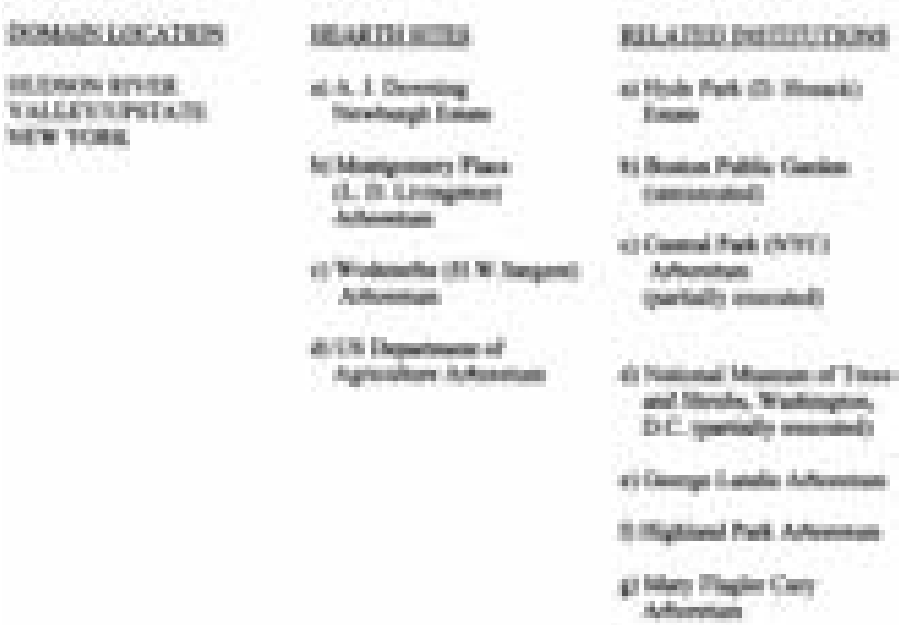


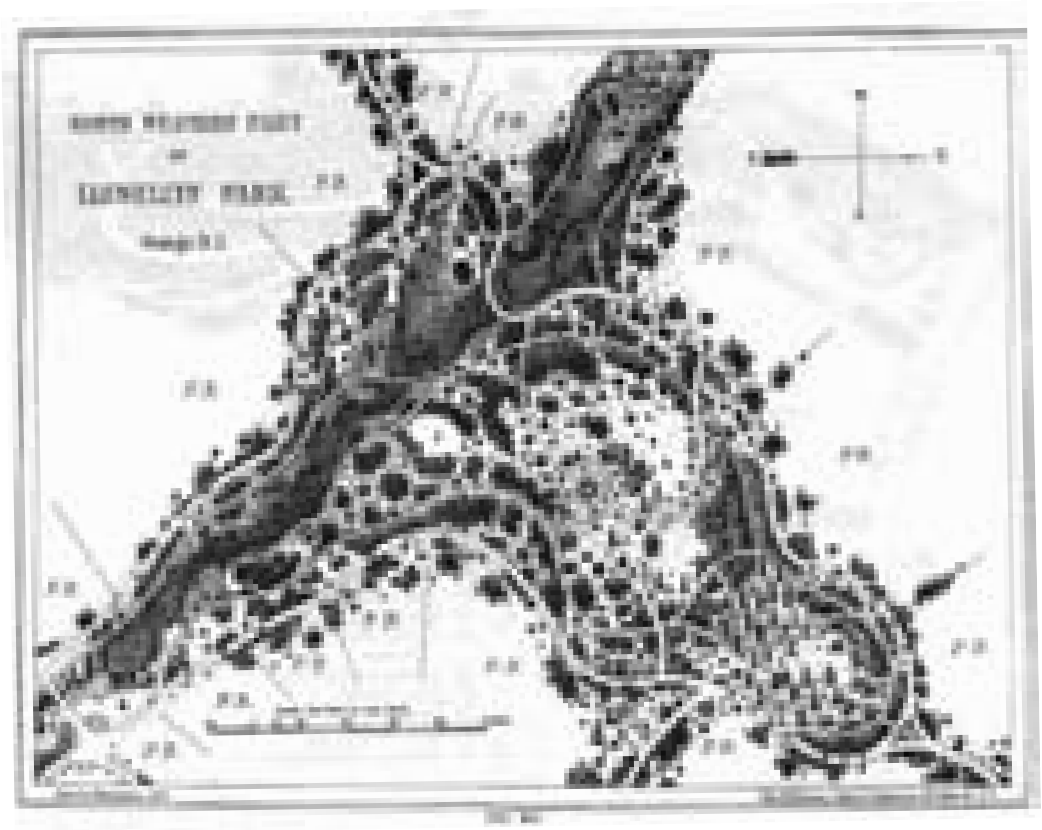
Figure 9. Arboricultural hearths/domains: cultural geography for theHudson River Valley/Upper New York State Arboricultural Hearth. Source: author, 2007

elite. However, over the next century, the suburban ideal – to work in the urban landscape but reside in a sylvan bower – became accessible to both the middle and working classes. North American suburbs, it can be argued, also came to share many design features and cultural agendas of modern arboreta.[35]

PRESIDENTIAL PLANTSMAN

While Andrew J. Downing's popular (and, to an extent, scholarly) reputation rests on his domestic landscapes, in the last decade of his short life, he, much like Loudon, became increasingly interested in metropolitan ones. In an 1841 letter to John Jay Smith, Downing described his current work on a Boston commission for the Massachusetts Horticultural Society desiring a public garden for the city. Schuyler succinctly presents its outcome: 'Downing, who proposed that the boundary be a scientifically arranged arboretum, prepared a list of trees and indicated the precise places where they were to be planted'.[36] He was eager that his design be carried out and was disappointed when it was not. Although Downing did not get the opportunity to design an arboretum in a Boston park, one of his later admirers, Charles Singer Sargent, nephew of H. W. Sargent of Wodenethe did at the Arnold Arboretum on Jamaica Plain in 1872. And while he lost the Boston commission, US President Millard Fillmore would invite him, in 1850, to accept a more prestigious and expansive opportunity – designing a national arboretum in Washington, DC.

But first enter John Quincy Adams, sixth US President (1825–29) and, in O'Malley's estimate, 'surely the most ambitious gardener to inhabit the President's House'.[37] Adams (see above) (Figure 8), a major supporter of the Columbian Institute for the Promotion of the Sciences and the Arts[38] in the organization's struggles to establish a Washington botanic garden on the west front of Capitol Hill, also contributed a large number of native North American trees throughout the District of Columbia. His extensive diplomatic experience abroad as an ambassador to four European nations and the first to Russia;



his ability to read the French botanical works of arboretum founders such as François Michaux's *Forêt et Arboretum d'Harcourt* and Henri Louis Duhamel du Monceau's *Des semis et plantations des arbre* (1760), made him a learned plantsman. He knew at first hand the arboreta and forestry school established by Andre de Vilmorin at Barres. His extensive personal library included both classic works (e.g. John Evelyn's *Sylva*) and contemporary publications (e.g. John Loudon's *Arboretum et Fruticetum Britannicum*). With good reason, Downing dedicated his 1841 edition of *Landscape Gardening and Rural Architecture* to the former President.

As President, Adams issued executive orders for the Treasury Department, the State Department, and the US Navy to embark on a programme of seed collection and plant introduction.[39] As Monceau had urged in France, Adams used his Act for the General Improvement of the Navy to preserve hardwood timber on government lands, as well as to purchase private property in order to establish national forests. For example, a 30,000-acre nursery of live oaks (*Quercus virginiana*) became a federal government preserve in Santa Rosa, near Pensacola Bay, Florida.

An early conservationist, Adams requested the Congress to create a Department of the Interior. When it refused, he complained that the preservation of forests was 'one of the most important branches of political economy'. It formed the basis of 'voluminous Legislation' in Europe and, in some nations, came under the protection of special departments. 'Here', he lamented, 'we have almost totally neglected it'.[40] Foiled by Congressional indifference, Adams advised his sons that no intellectual pursuit would be more 'beneficial to your Country, than the natural history of Trees and Plants'. And, for his four presidential years, he practised arboriculture, particularly on the north-west section of Washington's National Mall. Here he expanded the arboriculture and horticulture of the presidential grounds, securing and planting seeds and saplings for a series of gardens and nurseries. An additional nursery was established at the Adams family homestead in Quincy, Massachusetts. Adams envisioned the presidential grounds to be experimental as well as ornamental. For instance, he tried growing Spanish chestnuts, English walnuts, citrus and fruit trees, and every oak genus he could find. By the end of his presidential term, Adams had re-landscaped and planted the White House grounds to such an extent that landscape painter Anthony St John Baker documented it in a pleasing watercolour which he titled *The White House Arboretum*.

During his rancorous, politically inept, and personally disappointing four years in Washington, John Quincy Adams often turned to arboriculture as a patriotic duty, a personal comfort and, if not for immediate public accolade, then possibly posterity's gratitude. Desperate for a place in America's early political pantheon, Adams, with acute self-knowledge, realized this was not to be. As the demands and failures of public office overwhelmed him, he went on planting, hoping his tree-keeping would extend as 'a compass far beyond the possible duration of my own life', and believing that the fledgling White House Arboretum 'a century hence may be my successor'.[41] This, too, was not to be. Soundly defeated in the presidential election of 1828 by Andrew Jackson, Adams departed Washington after Jackson supporters, during the inaugural celebrations, trampled through the White House plantings.[42]

OPPOSITE Figure 10. Andrew Jackson Davis, '*The Entrance and Glyn Ellyn, Orange, N.J.*' (top) and '*Northwestern Part of Llewellen Park, Orange, N.J.*' (bottom); from Andrew Jackson Downing, *Landscape Gardening and Rural Architecture*, Intro. by George B. Tatum with Suppl. by Henry Winthrop Sargent, 6th edn (New York: Dover, 1991), pp. 570–2

ARBOREAL SMITHSONIAN

While Adams's efforts for a national arboretum centred on the President's Park, architect Robert Mills, at the request of Joel Poinsett,[43] first US Ambassador to Mexico and later Secretary of War in President James Polk's cabinet, prepared a series of landscape plans for the entire Mall in 1841. Robert Mills, a South Carolinian as was his patron Poinsett, had already won the national competition for the Washington Monument (an obelisk begun in 1844 but only completed in 1884; the proposed pantheon at its base [Figure 12], was never built). Mills envisioned the National Mall, in its entire length, as a public park that extended from his Greco-Egyptian obelisk honouring Washington eastward to the Capitol. The Mills' master plan ignored the President's Park and focused on two specific Mall sites: one for an expanded botanic garden at the base of Capitol Hill, and a second surrounding an English Gothic Smithsonian 'castle'. In 1844 Congress passed legislation regarding a faculty for a school of agriculture and the mechanical arts, experimental gardens, a library of science and economics, and a national museum under the aegis of the newly founded Smithsonian Institution. An arboretum, highlighting American natives of approximately two thousand trees, and of about two hundred species and varieties would be an outdoor arboreal museum complementary to the Smithsonian's indoor natural history museum.[44]

The proposed Smithsonian arboretum, however, did not completely satisfy supporters of a much larger, truly national outdoor museum. In 1840, William Darlington published an essay advocating a comprehensive national garden in the US Capitol, one which would 'procure from every region of the globe perfect specimens of every production of Nature'. He further argued, intoning the metaphor of a family tree, 'while at colleges they teach the various branches of knowledge, here at the common centre of the Republic, we should have the entire Tree, in perennial verdure, accessible to all who might desire to participate in its pleasures and benefits'.[45]

Darlington's critique of arboricultural parochialism received support from Asa Gray, Professor of Botany and Director of the Botanic Garden at Harvard College. Writing in 1844 on the longevity of trees, he bemoaned the lack of a national arboretum. After a discussion of the contributions of Andre and Francois Michaux to North American botanical science, Gray noted:

> to these two persons, chiefly, are the French plantations indebted for their surpassingly rich collections of American trees and shrubs; which long since gave rise to the remark, as true at this day as it was twenty years ago, that an American must visit France to see the productions of his native forests. When shall it be said that this statement is no longer true? When shall we be able to point to a complete, or even a respectable, American collection of our indigenous trees and shrubs?[46]

Finally, Patrick Barry, of the Mount Hope Nurseries in Rochester, New York, attempted to form an association for the specific purpose of collecting North American rare trees and plants. He, like Downing, had toured England's estate arboreta and public gardens (where he saw numerous western American conifers displayed thanks to David Douglas). It is also probable he knew of British tree collecting enterprises such as the Oregon Association of Edinburgh that, in 1850, sent John Jeffrey of Perthshire to collect plants in North America's Pacific Northwest. 'Our best landscapes', Barry told his readers, 'have been worked out of the original forest', and, while arboriculture had been mainly restricted to fruits, the growth of cities and towns and the rapid disappearance of natural forest created a new necessity to plant trees: 'With this came the need of organizations that promoted the collection of trees and the dissemination of knowledge about them'.[47] A national arboretum would be the obvious site for such collections.

A NATIONAL 'PUBLIC MUSEUM OF LIVING TREES AND SHRUBS'

Despite these proposals, both public and private, the National Mall remained largely unimproved, in one contemporary's appraisal, a bleak, inhospitable common, traversed by muddy trails and lacking trees except for an occasional volunteer sycamore. However, in November 1850, A. J. Downing, at the request of President Fillmore, went to Washington to survey the Mall. On 27 February 1851 he presented his master plan (Figure 11). It had three objectives: 'to form a National Park, which should be an ornament to the Capital of the United States'; to 'give an example of the natural style of Landscape Gardening which may have an influence on the general taste of the Country'; and to 'form a public museum of living trees and shrubs'.[48]

To accomplish this agenda, Downing first designed an extended 'landscape garden, to be traversed in different directions by gravelled walks and carriage drives, and planted with specimens, properly labelled, of all the varieties of trees and shrubs which will flourish in this climate'. He then subdivided his master plan into six 'scenes', as he labelled his six different landscapes which would exemplify different garden types and have different pedagogical functions.[49] Unlike the Mills mall plan of 1841, Downing included the Presidential grounds, making them, as had landscape architect Pierre Charles L'Enfant, part of a tripartite design that connected the executive and the legislative government branches by means of an expansive, linear mall. Downing hoped to develop a 'School of Public Instruction' in arboriculture, but stopped short of arranging his plantings, as had Loudon, according to any taxonomic system of classification.

As Therese O'Malley and other scholars have carefully documented, Downing's national arboretum drew upon his theory and practice of landscape garden design.[50] It also prefigured the concept of speciality gardens that other US and Canadian arboreta would include in their later site plans. As a North American public museum of living trees and shrubs, it was always open and charged no admission free. An arboretum visitor typically entered Downing's arboreal landscape via a suspension bridge at Fourteenth Street spanning the then existing Tiber Canal. The visitor then passed through a classical

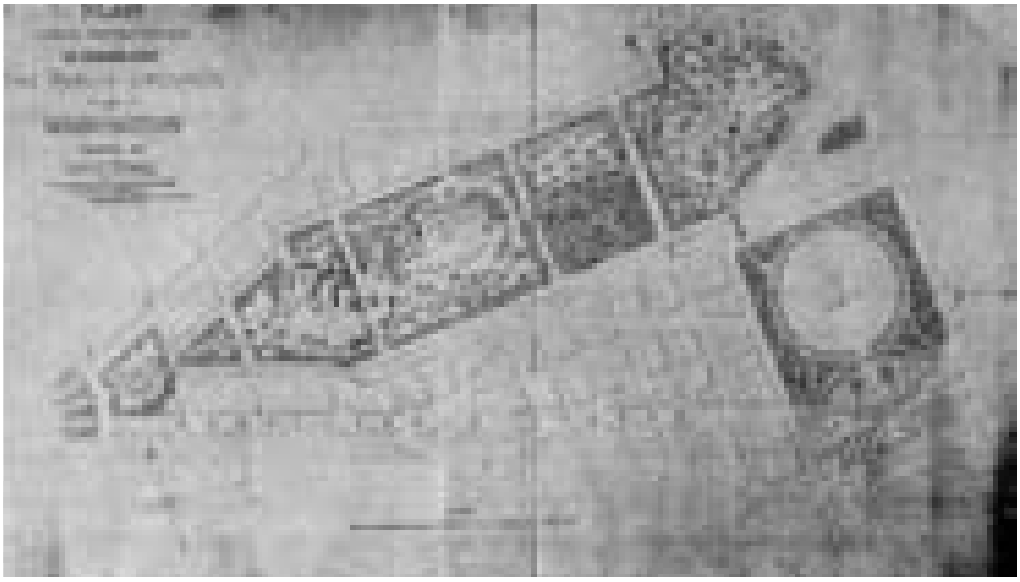


Figure 11. Andrew Jackson Downing, '*Plan Showing Proposed Method of Laying out the Public Grounds at Washington February 1851*'; from *Annual Report of the Army Corps of Engineers* (October 1867)

Triumphal Arch, which doubled as the arboretum's official entrance.[51] Access was also possible at several cross-street entrances.

Although usually an advocate of the picturesque, Downing proposed the classical arch as a visual connector that would re-establish L'Enfant's intended connection, architecturally and politically, between the classicism of the Capitol and the White House. The Arch, along with a suspension bridge also served to link two of Downing's arboretum 'scenes'. The first, the President's Park or Parade, had been the site of President J. Q. Adams's White House Arboretum. Downing recommended keeping 'the large area of this ground open, as a place for parade or military reviews as well as public festivities or celebrations' (e.g. children's Easter egg rolling events, initially held at the Capitol, became a White House event on its sloping South Lawn in the 1870s). Downing's expansive greensward was to be encircled by American elms, already America's most favourite street tree, which shaded a carriage drive.

Leaving the President's Park, an arboretum visitor came upon a second element of Downing's plan, Monument Park, which took its name from Robert Mills unfinished axis mundi honouring Washington. This speciality garden of the arboretum took its landscape format from the type of garden that Downing, in his many publications, termed 'the beautiful', the school of landscape gardening he deemed most appropriate for architecture in the classical styles. As suggested by a popular chromolithograph of 1852, '*Washington, D.C. with Projected Improvements*' (Figure 12), Downing planned to arrange a gallery of only North American native trees planted singly or in groups, to allow full expansion and adequate distance to view such specimens.

Proceeding east toward the Capitol, visitors entered the mostly densely planted feature of Downing's garden opera in six acts – the Evergreen or Winter Garden. Here, the symbolic, nationalistic and aesthetic dimensions of the Monument and President's spaces were further expanded by educational motives. In a 16-acre elliptical landscape, Downing suggested there be a museum of native evergreens, including broad-leaved laurels, rhododendrons and magnolias that would thrive in Washington's mild (USDA zones 6/7)

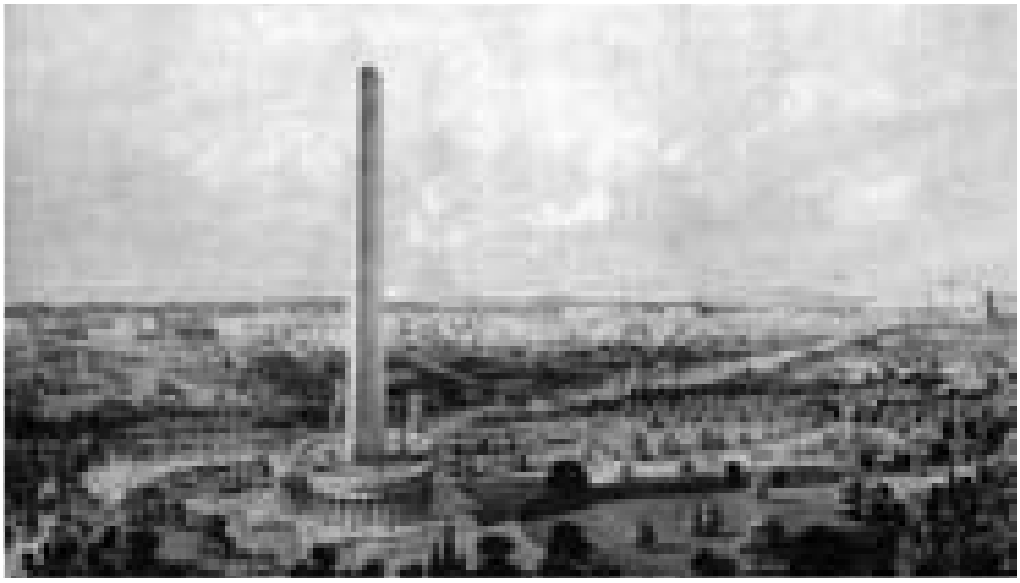


Figure 12. B. S. Smith, '*Washington D.C. with Projected Improvements Including Robert Mills' Design for the Washington Monument and Andrew Jackson Downing's Landscape Plan for the Mall*', lithograph (1852). Courtesy: Library of Congress, Washington, DC

winter. Downing's objective in creating an impressive Washington Winter Garden may have been as much political as botanical. He admitted that he hoped to introduce '130 new species and varieties' into a landscape that would be particularly popular during the time of year when the Congress was in session and the city's population at its seasonal height.[52]

Evergreens, particularly conifers, had an important place in the Smithsonian Park that Downing designed around James Renwick's Smithsonian Institution Building, constructed between 1847 and 1855, the exterior of which was completed by 1851. Here the picturesque was also the pride of the place. The Smithsonian garden was to be 'thickly planted with the rarest of trees and shrubs, to give greater seclusion and beauty to its immediate precincts'. It included both an assemblage of 'choice trees in the natural style', plus carefully sited conifers to enhance the irregular projections, turrets, towers and overall asymmetry of Renwick's Gothic sandstone castle.[53]

As the fifth feature of his master plan, Fountain Park, Downing proposed to redesign a part of the city's Tiber Canal in order to create two water features, a formal fountain and an artificial lake. He then terminated his national mall arboretum by incorporating the grounds and greenhouses of the US Botanic Garden at the foot of Capitol Hill.[54] Reversing a practice that became common among some subsequent North American botanical gardens that added pineta or arboreta to their original landscapes, Downing added a botanical garden and a pinetum (Winter Garden) to his arboretum.

Downing recognized how drastically his comprehensive plan for the Mall differed from what L'Enfant had vaguely outlined sixty years earlier for the Mall. L'Enfant's 'grand avenue' was monumental and imperial; Downing conceived of the same Mall acreage as multiple and picturesque. He specifically acknowledged the aesthetic contrast of the planted mall versus the hardscape grid by noting:

> The straight lines and broad avenues of the streets of Washington would be pleasantly relieved and contrasted by the beauty of curved lines and natural groups of trees in the various parks. By its numerous public buildings and broad avenues, Washington will one day command the attention of every stranger, and if its unimproved public grounds are tastefully improved, they will form the most perfect background or setting to the city, concealing many of its defects and heightening all its beauties.[55]

Advocating diversity in his planting selection, varying the site's topography through display mounds (à la Loudon at Derby) and water features, and seeking to provide individual visitors with a personal, diversified experience of nature, Downing's vision of a public, national and capitol landscape had but piecemeal progeny. In the second half of the nineteenth century, Downing's master plan came to be re-interpreted and neglected by assorted planners and designers, each with a partial, rather than panoramic, perspective. William Saunders, the landscape architect of the Awbury's estate arboretum in Philadelphia, endeavoured to perpetuate Downing's principles in his 1870 design for an arboretum around the grounds of the newly created (1862) Department of Agriculture at the south-west end of the Mall.[56] However, changing District of Columbia superintendents of public works, a prolonged civil war, plus a legislature indifferent to supporting public improvements, doomed the comprehensive plan, despite petitions to Congress by Downing admirers such as Frederick Law Olmsted. The US Congress would not seriously consider creating a national arboretum again until 1927.

REFERENCES

[1] John Claudius Loudon, *Encyclopedia of Gardening* (London, 1822).

[2] In this paper, I follow a modern appraisal proposed by Stephen Spongberg, former Curator at the Arnold Arboretum and Director of the Polly Hill Arboretum: 'An arboretum is a place where a collection of native and/or exotic woody or ligneous plants – trees, shrubs, and woody climbers – is obtained and cultivated for scientific, conservation, educational, and/or aesthetic purposes. By extension, an arboretum is an institution or organization involved in bringing together, establishing, utilizing, and maintaining such a collection. The term derives from the Latin *arboretum* (a place grown with trees) and *arbor* (tree). An arboretum can be distinguished from a botanical garden as a botanical or horticultural institution that specializes in the development, cultivation, and utilization of a collection of ligneous plants to the exclusion of herbaceous plants. While a botanical garden may incorporate an arboretum (sometimes at a different site than the botanical garden itself) where collections of woody plants are concentrated, few arboreta in the strict sense actively seek accessions of, or devote space to, herbaceous plants other than for landscape effect. However, in practice no hard and fast distinction can be drawn between the two'; William A. Nierenberg (ed.), *Encyclopedia of Environmental Biology* (New York: Academic Press, 1995), I, p. 81.

[3] As of 2007, there are approximately fifty-two university arboreta, twenty-four college arboreta and twelve junior college arboreta in North America. On the historical, botanical and landscape architecture of the North American college campus, see Paul V. Turner, *Campus: An American Planning Tradition* (Cambridge, MA: New York Architectural History Foundation, 1984).

[4] The longevity of the Mid-Atlantic hearth (1730–1850) is further documented in modern scholarship by William M. Klein, Jr, former Director of the Morris Arboretum, in *Gardens of Philadelphia and the Delaware Valley* (Philadelphia: Temple University Press, 1995), and continued by John G. Hope and Blair Seitz, *Gardens of Philadelphia: Gardens and Arboretums of the City and Delaware Valley* (Philadelphia: RB Books, 2004).

[5] Scholars have paid the most research attention to the roles of the Philadelphia Quaker family of John, William and Ann Bartram, and their farm, nursery and botanical collections at Kingsessing, Pennsylvania. The collection edited by Nancy E. Hoffman and John Claudius Van Horne, *American's Curious Botanist: A Tercentennial Reappraisal of John Bartram 1699–1777* (Philadelphia: American Philosophical Society, 2004), is the most recent assessment. Other Quaker enterprises in the Mid-Atlantic arboricultural hearth would include John Bartram's cousin, Humphrey Marshall, who at West Bradford, Pennsylvania, in the estimate of one interpreter, planted 'the first American arboretum' as well as writing the *Arbustrum Americanum, the American Grove* (1787), 'the first publication in America written by an American on American Trees, and the first attempt to discuss as a unit all of the flora of the area included in the new United States'. Richard J. Campana, *Arboriculture: History and Development in North America* (East Lansing: Michigan State University Press, 1979), p. 64. Other Quaker sites discussed in this paper are the Awbury and Pierce arboreta.

[6] This paper is drawn from two early chapters of a book manuscript tentatively titled *Keepers of Trees: A Cultural History of North American Arboreta, 1700–2000*. For additional details on the book's contents, see http://www.nd.edu/~tschlere/Tjschlereth/Keepersoftrees.htm/.

[7] A set of Humphry Repton's Red Books is in the Special Collections of the Haverford College Library. When current Arboretum Director William Astifan, a landscape architect, published a view of a Repton ideal landscape in the *Haverford Arboretum Association's Newsletter* (2000), pp. 1, 2, readers easily recognized the similarity of the image when compared with depictions of the Arboretum's Duck Pond and Barclay Beach on the Haverford campus.

[8] Rachel McMasters Miller Hunt, *William Penn*, *Horticulturist* (Pittsburgh: University of Pittsburgh Press, 1994). In addition to the historical painting of Penn under the Treaty Elm, Benjamin West is the painter to whom a full-length portrait of William Hamilton and his niece, Anna Hamilton Lyle, is usually attributed. It is in the collection of the Historical Society of Pennsylvania.

[9] Jefferson's correspondence with Hamilton is cited in Edwin Morris Betts, *Thomas Jefferson's Garden Book, 1766–1824* (Philadelphia: American Philosophical Society, 1944), pp. 323–4.

[10] Karen Madsen, 'To make his country smile: William Hamilton's Woodlands', *Arnoldia*, 49(2) (1988), pp. 15–18.

[11] W. P. Culter and J. P. Culter, *Life, Journal and Correspondence of Rev. Manasseh Cutler* (Cincinnati: Robert Clark & Co., 1885), quoted in Elizabeth McLean, 'Town and country gardens in eighteenth-century Philadelphia', *Eighteenth Century Life* (1973), pp. 144–5. Betts, *Jefferson Garden Book*, pp. 323, 344.

[12] Two detailed assessments of William Hamilton's place in North American garden history are: Joel T. Fry, *The Woodlands: An Archaeological Research and Planning Survey* (Philadelphia: University City Historical Society, 1995); and Karen Madsen, 'William Hamilton's Woodlands', pp. 14–24.

[13] The oldest North American ginkgo

specimen survives in the historic Bartram site, it being a gift to John Bartram from William Hamilton.

[14] Betty Smith, *A Tree Grows in Brooklyn* (London: Penguin, 1951).

[15] Campana, *Arboriculture*, pp. 16–17; 34–5; Penelope Hobhouse, *Plants in Garden History: An Illustrated History of Plants and their Influence on Garden Styles from Ancient Egypt to the Present Day* (London: Pavilion, 1992), p. 266.

[16] Campana, *Arboriculture*, pp. 36–7; Therese O'Malley, 'Landscape gardening in the early national period', in Edward Nygren and Bruce Robertson (eds), *Views and Visions: American Landscape before 1830* (Washington, DC: Corcoran Gallery of Art, 1986), p. 142.

[17] Stephen A. Spongberg, *A Reunion of Trees: The Discovery of Exotic Plants and their Introduction into North American and European Landscapes* (Cambridge, MA: Harvard University Press, 1990), p. 60.

[18] Francois Andre Michaux, *Travels to the West of the Allegheny Mountains in the States of Ohio, Kentucky and Tennessee* (London: B. Crosby & J. F. Hughes, 1805), p. 27; Frederick Pursh, *Flora Americae septentrionalis* (London, 1814), pp. viii–ix. Henry Savage, Jr and Elizabeth J. Savage, *André and Francois André Michaux* (Charlottesville: University Press of Virginia, 1986) is the most comprehensive (in English) study to date.

[19] Andre Michaux, *Histoire des chênes de l'Amerique septrentrionale* (Dublin: printed by Graisberry & Campbell, 1801); *idem*, *Flora boreali – Americana* (Parissiis et Argenntorati: fraters Levault, 1803) – the last work being the first flora of the area.

[20] Jacob Richard Schram, 'Influence – past and present of Francois Andre Michaux on forestry and forest research', *Proceedings of the American Philosophical Society*, 101 (1957); Savage and Savage, *Michaux*, pp. 342–7.

[21] Quoted in Fry, *Woodlands*, p. 23; Mary C. Scatterfood, *A History of Awbury* (Three Oaks, Michigan: Henry Regnery, 1972), pp. 4–6.

[22] Douglas Kane, 'Awbury Arboretum: a family enclave assumes a public purpose', *Germantown Crier*, 34(3) (1982), p. 65.

[23] Reuben Rainey, 'William Saunders', in Charles A. Birnbaum and Robin Karson (eds), *Pioneers of American Landscape Design* (New York: McGraw Hill, 2000), p. 327.

[24] Elizabeth Stewardson Cope and Margaret Cope, *Awbury Memories: Recollections of Elizabeth Stewardson Cope and Margaret Cope* (Germantown: Awbury Arboretum Association, 1994).

[25] A representative sample of private nineteenth-century North American sites that became public in the early twentieth century includes the Cope, Pierce, Morris, Longwood, Awbury, Baynard Cutting, and Planting Fields Arboretum.

[26] Robert R. Gutowski, 'Humphrey Marshall's living collections, 1773–1813'. MSc thesis, University of Delaware, 1988, pp. 4–8; Charles S. Sargent, 'Humphrey Marshall', *Garden and Forest* (8 November 1893), pp. 461–2.

[27] Andrew J. Downing, *The Horticulturist* (June 1852), p. 249; Josiah Hoopes, *The Book of Evergreens. A Practical Treatise on the Coniferae or Cone-bearing Plants* (New York: Orange, Judd & Co., 1868).

[28] If there is one North American eighteenth-century botanical garden/arboretum/nursery site to be reproduced in a publication on the period, it will, almost assuredly, be that of the Bartram family home and its 5-acre plantings between the residence and the Schuykill River. Examples can be found in *A Draught of John Bartram's House and Garden as it Appears from the River* (*c*.1758) in Therese O'Malley, 'John Bartram (1699–1777)', in Charles A. Birnbaum and Robin Karson (eds), *Pioneers of American Landscape Design* (New York: McGraw Hill, 2000), p. 18; Nancy E. Hoffman and John Claudius Van Horne, *America's Curious Botanist* (Philadelphia: American Philosophical Society, 2004), frontispiece. Consequently, readers do not realize that the 5-acre plot is *not* the entire site. O'Malley and Frye have documented that the family's land holdings actually included at least another 200 acres.

[29] To use but a single example, the Holden Arboreta in Kirkland, Ohio, in the 1940s allowed its members to use its lakes for swimming and fishing, natural areas for game hunting and its sloping meadows for cross-country skiing.

[30] Leslie Spraker, *Tulip Trees and Quaker Gentlemen* (Kennett Square: Longwood Gardens, 1975), pp. 20, 25, 62–5; Frederick E. Roberts, 'Horticulture at Pierce's Park, 1789–1905', research completed for an MSc in Ornamental Horticulture, University of Delaware, 1971, pp. 9–19.

[31] Images of the two commemorative monuments can be found, for Loudon, in Kensal Green Cemetery, London, photographed by Melanie Louise Simo for *Loudon and the Landscape, From Country Seat to Metropolis, 1783–1843* (New Haven and London: Yale University Press, 1988), p. 289; and, for Downing, David Schuyler, *Apostle of Taste: Andrew Jackson Downing, 1815–1852* (Baltimore: John Hopkins University Press, 1996), p. 224. Also 'The Downing Monument', *Horticulturist*, n.s., 6 (November 1856).

[32] Nathaniel Parker Wills, the editor of the weekly *Home Journal*, also wrote of his own suburban idyll in *Outdoors at Idlewild* (New York: C. Scribners, 1855) and in *American Scenery* (London: G. Virtue, 1840).

[33] Andrew J. Downing, 'Our country villages', *The Horticulturist* (June 1850), pp. 537–41; Schuyler, *Apostle of Taste*, pp. 208–9.

[34] Chautauquas, considered by US President Theodore Roosevelt to be 'the most American

thing about America', were a widespread adult education movement, begun in Chautauqua, New York, in 1874, within this study's second arboricultural hearth. The events of a Chautauqua (lectures, musical recitals and concerts, picnics, entertainments) – strikingly similar to many modern arboreta summer evening special events programming – could last a week, a month or a summer. Nebraska's 'Chautauqua' Arboretum, founded in 1999, is planted on a former chautauqua site.

[35] In addition to resembling some college campuses, garden cemeteries, public parks, and private estates, North American arboreta share several characteristics of the landscape architecture of the continent's chautauquas church summer campgrounds, and planned suburbs. In the latter case, Frank Lloyd Wright included a large arboretum in his model suburb, Broadacre City.

[36] Andrew Jackson Downing to John Jay Smith (November 1841); quoted in Schuyler, *Apostle of Taste*, p. 76.

[37] O'Malley, 'Landscape gardening in the early national period', p. 152.

[38] The Columbian Institute, founded in 1816, evolved into the US Botanic Garden and is administered by the US Congress.

[39] Treasury Department Circular Regarding Plant Introduction (6 September 1827); repr. in Nelson Klose, *American Crop Heritage* (Ames: Iowa State University Press, 1985), pp. 141–6.

[40] Jack Shepherd, 'Seeds of the presidency: the Capitol schemes of John Quincy Adams', *Horticulture* (January 1983), p. 41.

[41] Ibid., p.46.

[42] Another American President, John F. Kennedy (1960–63), has been honoured by a 623-acre arboretum in Wexford, Ireland. The site already contains four thousand five hundred trees and shrubs from the temperate regions of the world, planted in botanical sequence. President Adams would have particularly admired the arboretum's two hundred forest plots grouped according to their continents of origin.

[43] Poinsett introduced the South American wildflower, *Euphorbia pulcherrima* (commonly known as the Poinsettia), to North America in 1825.

[44] John M. Bryan, *Robert Mills: America's First Architect* (New York: Princeton Architectural Press, 2001), pp. 256–320.

[45] William Darlington, 'A plea for a national museum and botanic garden to be founded at the Smithsonian Institution at the city of Washington' (Westchester, 1841), pp. 10–12.

[46] Asa Gray, 'Arboreta', in Charles S. Sargent, *Scientific Papers of Asa Gray*, 2 vols (Boston: Houghton Mifflin, 1889), II, p. 74.

[47] Patrick Barry, 'Association for collecting rare trees and plants', *Horticulturist*, 4 (1850), pp. 483–4.

[48] Andrew J. Downing to President Millard Fillmore (3 March 1851), quoted in O'Malley, 'Public museum of trees', p. 9.

[49] The quotations that follow are based on Andrew Jackson Downing, 'Explanatory Notes to Accompany the Plan for Improving the Public Grounds at Washington, D.C.' (3 March 1851). Records of the Commissioners of Public Buildings, Letters Received, RG 42, LR, vol. 32, National Archives, Washington, DC. Also Wilcomb E. Washburn, 'Vision of life for The Mall', *Journal of the American Institute of Architects*, 47 (March 1967), pp. 52–60; and John Reps, 'Downing and the Washington Mall', *Landscape* (1967), pp. 6–11.

[50] I am indebted to a quartet of historians who, when read in comparison, provided me with a detailed, collective overview of Dowling's master plan. In addition to Therese O'Malley and Wilcomb Washburn (already cited), they include David Schuyler, 'The Washington Park and Downing's legacy to public landscape', in George B. Tatum and Elisabeth Blair MacDougall (eds), *Prophet With Honor: The Career of Andrew Jackson Downing, 1815–1852* (Washington, DC: Dumbarton Oaks Research Library and Collection, 1989), pp. 291–311; Judith K. Major, *To Live in the New World: A. J. Downing and American Landscape Gardening* (Cambridge, MA: MIT Press, 1997), pp. 158–65; and Washburn, 'Vision of life for the Mall', pp. 50–4.

[51] A sketch of Downing's proposed entrance arch is reprinted in Schuyler, *Apostle of Taste*, p. 196.

[52] O'Malley, 'Public museum of trees', p. 69.

[53] Ibid., p. 68.

[54] The diminutive US Botanical Garden was then attempting to make room in its cramped quarters for the cache of botanical treasure brought back to America by the Charles Wilkes Expedition of 1838–42, the US's first overseas botanical and zoological abroad.

[55] Wilcomb Washburn, *The First Attempt to Humanize the Mall: Andrew Jackson Downing's Plan of 1851* (Washington, DC: Smithsonian Institution, 1967). A manuscript version quoted by O'Malley, 'Public museum of trees', pp. 65, 67, 68, 69, 76.

[56] Rainey, 'William Saunders', pp. 329–31; also 'William Saunders' [Obituary], in *Yearbook of the United States Department of Agriculture* (Washington, DC: Government Printing Office, 1900); Rainey considers Saunders's Mall Arboretum as the second most comprehensive example in North American after the Arnold Arboretum in Massachusetts (p. 331).

MAX BOURKE

TREES ON TRIAL: ECONOMIC ARBORETA IN AUSTRALIA

Arboreta and other plant introduction systems provide a framework for a study of the history of science and especially ecology. In Australia the story began with economic botany and the development of a plantation economy. It led, via John Claudius Loudon's exhortations to plant a garden as 'proof of possession', to acclimatization and on to the 'modern scientific' project of plant exchange and trials. Trees in arboreta form the major physical manifestation of this research.

The trial of new tree species and, indeed, many other plant species was a major project of the administrators of the first settlements in Australia. Initially it had been guided by advice from Sir Joseph Banks and Directors of Kew Gardens. As professional botanists and scientists were recruited to the service of the colonies, the science of searching for useable tree species and their improvement became an important issue in both the public and private domains. Trees were needed for the vast array of plant-based products that drove the nineteenth century and for aesthetic purposes to make both public and private spaces more attractive. It was rarely considered initially that any but imported species of trees could fill these roles. This paper is the story of that experimentation.

John Claudius Loudon's (1783–1843) lesser-known work, *An Encyclopaedia of Agriculture* (London, 1825) did much to encourage new settlers to develop commercial plantations. He posed the question 'for what is a landscape without wood?'[1] In part he answered that this was an important investment as a 'plantation' would attract 'compound interest'. He was, of course, well aware of the 'plantation economy' model of new settlement. Colleen Morris has documented the impact Loudon had on Australian colonial society, where his books and magazines were bought in large numbers by individuals and institutions, through his Sydney or Hobart agents or mailed direct. As Morris also points out, his impact reverberated further because of the ideas brought to Australia by gardeners influenced by him.[2]

BOTANIC GARDENS, ACCLIMATIZATION GARDENS AND ARBORETA

The terms 'botanic' or 'acclimatization' gardens and 'arboreta', from time to time, are used interchangeably. All have been used as places where trials of different species and cultivars of trees have been conducted on a scientific basis. In the Australian context there is a particular relevance for this as the nomenclature, in a sense, tracks the historic changes. The terms 'arboretum' and 'acclimatization garden' came into English use by the mid-nineteenth century, and this coincided with the early Australian developments. Clearly there were different nuances when Loudon recommended to the benefactor of the Derby Arboretum that it be an 'arboretum' rather than a 'botanic garden' as the costs of upkeep of the latter would be too high.[3] All of the spaces discussed in this paper fit

Fenner School of Environment and Society, Australian National University, Canberra 2600, Australia

the *Oxford English Dictionary* definition of an arboretum.[4] Finally, it is worth noting the 'Defining Characteristics of a Botanic Gardens [*sic*]' as set out by the International Union for Conservation of Nature and Natural Resources (IUCN)[5] Botanic Gardens Conservation Secretariat at Kew.[6] Many hundreds of arboreta have been created in Australia over the last two centuries. The scientific and economic imperatives causing the development of these arboreta will be pursued by a series of examples from the early nineteenth to the early twenty-first century in Australia.

THE FOUNDING COLONY: SYDNEY

In Sydney the botanical gardens grew out of the Governor's garden. Here the whole garden was, to some extent, 'experimental', though one area was specifically designated in this way (Plate XXI). As John Dargavel has remarked: 'The Europeans who disembarked or were dumped on Australia's shores searched their new land for anything they could export … by and large the forests were disappointing'.[7] Accordingly, the search for crops to grow for food and shelter was urgent. A site for a garden for the Governor was prepared in February 1788, and this site later became the Botanical Gardens (still later The Royal Botanic Gardens, or RBG). From seed the early settlers tried to grow, besides staples, coffee, oranges, lemons, firs and oaks.[8] From its inception *c.*1816 (the date is not fixed with certainty) the Government Gardens provided a way of introducing new species of plants and spreading them around the colony, as noted by Commissioner Bigge (Figure 1):

> The value of such an establishment, both in affording means of collection and of experiment and, more particularly, of diffusing throughout the colony the most valuable specimens of foreign grasses, plants, and trees, is unquestionable.[9]

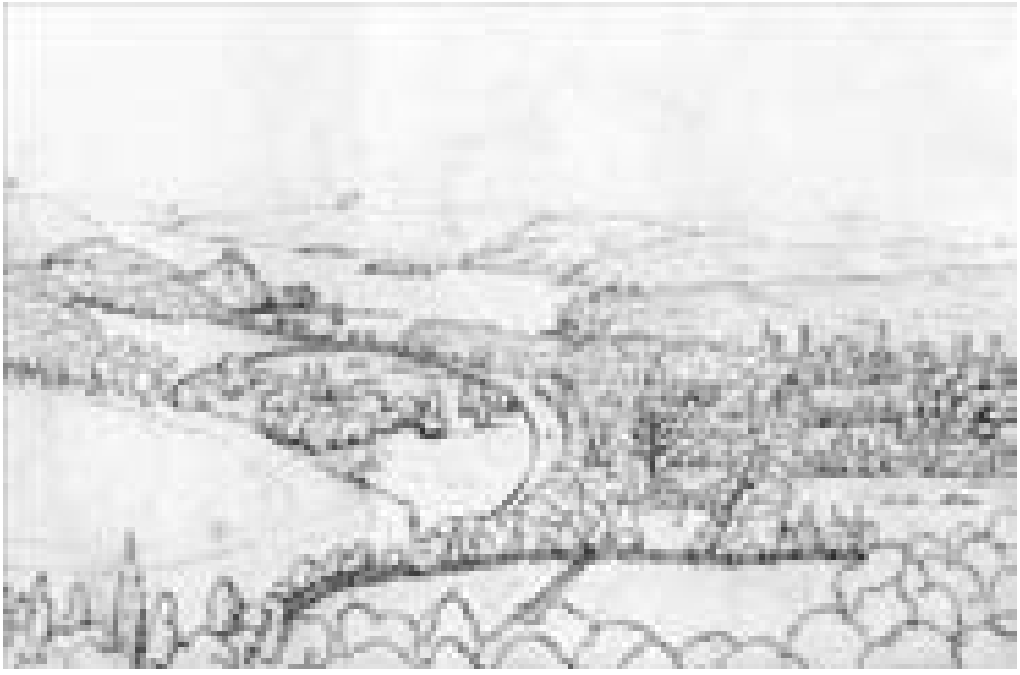


Figure 1. Thomas Woore, 'Looking east across The Domain and Botanic Gardens' (1829), one of a series of drawings by Woore titled '*Panorama of Sydney*'; Mitchell Library, State Library of New South Wales, Sydney, SVI/1829/1

Under successive administrations and curators/directors, the role of a plant introduction centre was pursued. This at all times included tree species and parts of the gardens were set out as an arboretum and a relict of the plan survives today in the palmatum. The RBG played a key role before the establishment of agricultural or forestry research stations in enabling the evaluation and seed increase of economic species up until well into the twentieth century. This garden continued its role as a plant introduction site, administered by the Department of Agriculture until the mid-twentieth century.

THE COLONY OF VICTORIA: MID-TO-LATE NINETEENTH CENTURY

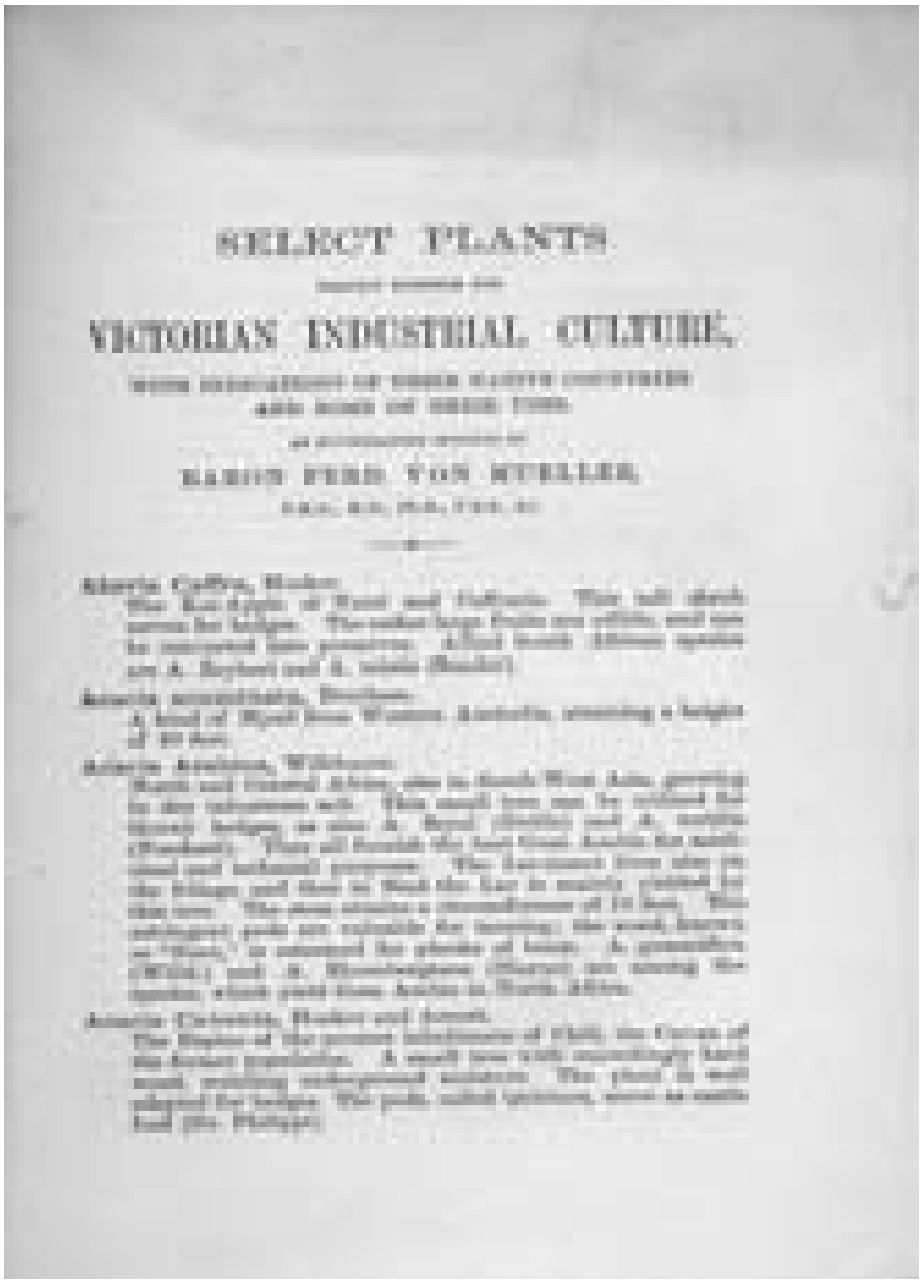
The Port Phillip District in the Colony of New South Wales (NSW) was still administered from Sydney when, in 1846, the Governor approved the reservation of 120 acres (48 hectares) of land on the Yarra River for the establishment of botanic gardens. This was eleven years after first settlement and five years before declaration as a separate colony. These gardens were set aside, according to the *Port Phillip Gazette*, in late 1841 for 'rearing and cultivating indigenous and exotic plants'.[10] This garden became, in many ways, the centre for government plant introduction due to the influence of Ferdinand Mueller (see below), whose activities covered Australia.

As well during the nineteenth century, contemporary with the English fashion, collections of trees, including the creation of specialized types such as the pinetum and the palmetum, were established by wealthy people. The Colony of Victoria had a number of the former, due to its wealth at this time. There was something of a sense of 'competition' with England to have the latest plants. An example was the selling point for a nursery in Ballaarat in 1863, which attested: 'This very beautiful herbaceous plant was brought to England two years ago'.[11] Paul Fox gives an idea of the effort by 'colonial grandees' to compete with each other to mimic English planting fashions in Victoria at that time.[12] One such 'gardener' (later to become the first 'forestry manager' in the colony and a nemesis of Ferdinand Mueller) was William Ferguson. He managed the estate of a wealthy Melbourne businessman, though he later became an ardent 'protector' of the native forests. He wrote in 1861:

> Private enterprise has done much more to introduce rare and ornamental trees than ever Government has done; but I hope yet to see the Gums and Wattles supplanted by the noble Araucarias, of Moreton Bay, Norfolk Island and New Caledonia, trees that for ornament are second to none on the face of the globe.[13]

Ferguson was an example of a private plant introducer who subsequently went on to direct the early public forestry domain.

John Gould Veitch, the London nurseryman, remarked in 1866 how new species 'are received in Melbourne a few months after becoming known at home'.[14] But the search for economically valuable plants both indigenous and imported into Australia was a scientific project of the utmost importance. Ferdinand Mueller, the Government Botanist and later the founding Director of the Botanic Gardens, Melbourne, was at the centre of a web of plant introductions and seed exchanges that reached around the globe. Mueller was closely involved in the Victorian acclimatization movement. He published his great project on economic species introductions in a major publication which was subsequently used for teaching purposes in the USA as well as Australia (Figure 2).[15] These writings were mainly offered 'with a view of promoting the introduction and diffusion of the very many kinds of plants, which in our geographic latitudes may be extensively reared in forests, on fields or pastures'.[16]



SELECT PLANTS

VICTORIAN INDUSTRIAL CULTURE,

BARON FERD VON MUELLER,

Figure 2. Title page of Baron Ferdinand Von Mueller's *Select Plants Readily Eligible for Victorian Industrial Culture, with Indications of their Native Countries and Some of their Uses* (Melbourne: Government Printer, 1876)

Mueller was consistently attacked for his greater attention to running an 'economic' botanic garden than many people liked. On the one hand he was accused of taking away business from commercial nurseries and, on the other, those who wanted a pleasure garden did not like his scientific layout. Eventually his commitment to economic plants and science contributed to his downfall as Director of the Botanic Gardens. But examples of his 'reach' include the Municipal Gardens in Geelong and Colac and private collectors,

Figure 3. Jephcott Arboretum today, Ournie, New South Wales. Photo: M. Bourke

such as Edwin Jephcott on the Upper Murray River in NSW (Figure 3). Edwin Jephcott created this arboretum in 1864 and Mueller provided over three hundred species of mostly conifers. Today some one hundred and fifty species remain, including some of the largest of type in Australia.[17] Jephcott was to trial conifers for Mueller in exchange for collecting local species of plants for the Melbourne Herbarium. Between 1859 and 1867 Mueller distributed some 355,218 plants, mainly conifers, to public reserves.[18] His tree planting and introductions were aimed at both forestry and amenity uses, as well as the creation of regional gardens in Victoria and elsewhere. It should be noted that encouraging amenity uses included street plantings, which was an 'economic use' of trees.

FROM COLONIES TO FEDERATION – CANBERRA: THE EARLY TWENTIETH CENTURY

With the Federation of the Australian colonies, the establishment of a national capital came onto the national political agenda. The winner of the competition to design the national capital was Chicago architect Walter Burley Griffin. He had, like most of his colleagues in the Prairie School, a deep attachment to the ideas and practices of Frederick Law Olmsted and, more particularly, Wilhelm Miller.[19] Miller, though less well known, was influential in encouraging the use of native trees in landscape design in North America through his teaching and writing. Both of these leading landscape designers placed great stress on tree plantings.

Griffin brought with him a strong concern for arboriculture, both economic and for amenity, and proceeded to make his city of Canberra, in many ways, into a large arboretum (Plate XXII). He laid out an international arboretum to occupy a prominent position on the lake shore. He also saw silviculture and agriculture as part of the city he was designing and working with the British horticulturist Charles Weston, they created a form of arboretum throughout the city (Plate XXIII). On his arrival in May 1913 to take up his Canberra appointment, Weston's:

> initial priority was experimentation. He assessed the suitability of a wide range of exotic and indigenous trees and shrubs for the site and devised the best methods of planting and establishment. On a 160-hectare site at Yarralumla, Weston supplemented the Acton Nursery with a much larger nursery and arboretum. The nursery served not only as a place for experimentation but also for the production of plants. The arboretum, to test the growth of trees, was commenced in 1914. By 1920, almost 45,000 trees had been planted there.[20]

In 1917–18 Weston planted in the Canberra Arboretum some 256 species and cultivars of mostly trees and some shrubs of introduced species. He planted a further ninety species of *Eucalyptus* in an adjoining block. On two other sites he planted respectively seventy-five introduced species and seventy species of *Eucalyptus* and *Acacia* to trial the performance of these various types in differing soils and aspects.[21]

These arboreta have largely survived, though through their use as amenity spaces and road development some have been damaged and many species which did not survive were not replaced. One of the species planted, *Pinus torreyana*, has become rare in the USA and seed collections from US Forestry services have been made to replenish the genotype in the USA.[22] Much useful information came from these arboreta for street tree introductions, which shaped plantings in both public and private spaces and contributed significantly to forestry training and research in Australia.

FORMAL FORESTRY TRAINING AND RESEARCH: THE EARLY TWENTIETH CENTURY

For almost a century these arboreta and plant introductions have been playing an active part in both plant exchange and softwood forestry practice. They were used for training of foresters, by foresters in Australia in the search for economic forestry species, and they have been widely used in Australia for the development of street trees. Seeds from these early twentieth-century introductions now form part of a valuable plant exchange for endangered species.

From the end of the nineteenth century there was a perceived need for softwood timbers, which led most Colonies of Australia to take tentative steps towards both forest management and species introductions into plantations.[23] Many of the Australian colonies passed legislation to protect forest reserves and to set up forestry agencies with timber management or conservation as their objective.[24] As that happened they began to undertake forestry research and a new wave of arboreta for commercial introductions was commenced. When formal forestry training commenced in the late nineteenth and early twentieth centuries, they had standard teaching texts which were widely available, such as Sir William Schlich's *A Manual of Forestry* and Robert Troup's *Silvicultural Systems*.[25] While these discussed the use of exotic species, they did not set out formal designs for tree trials or arboreta. However, Major Thomas Ford Chipp MC, then Assistant Director at the Royal Botanic Gardens Kew, published an important article in 1925 on the history and the use of arboreta (though he referred to them as 'arboretums') in the *Empire Journal of Forestry*.[26] Chipp stressed that forests must work on a 'definite profit and loss basis and show a credit balance at the end of a rotation' and, accordingly, the arboretum is the place for tree research. Shortly after this time The International Union of Forest Research Organisations attempted to develop a standardized format for establishing forest plot trials in arboreta.[27]

Denise Gaughwin has made a study of the species trials and arboreta in the State of Tasmania, which were commenced slightly after the other states.[28] It is interesting to note in this extensive project that Blue Gum (*Eucalyptus globulus*), now one of the world's

most widely used plantation species, was only considered very lightly in these trials. In South Australia the late forest trial arboreta were created from the 1870s.[29] A typical example of the state forestry process is the Bago State Forest Arboretum in NSW. From the 1920s over fifty species of trees, mostly conifers, were trialled in small plots at this Pilot Hill Arboretum. *Pinus radiata* consistently outperformed all other species in these trials and so was adopted for production forestry. Today, this site and some others have been retained as amenity arboreta, which, while remote, are well used.

Among forestry researchers, the creation of arboreta was seen as part of a research continuum. Up to *c.*1960, arboreta were established for the introduction of new genetic material, either from other regions of Australia or introduced species. In the early 1960s, provenance trials commenced, where the focus was on the introduction of cultivars within species, which appeared promising. From the late 1960s, experimental plantations were established to test both progeny trials and clonal trials developed from plant breeding within Australia and elsewhere.[30] S. D. Richardson summarized this process as part of a world-wide review of forestry genetics:

> arboretums have generally been established as collections of individual trees for limited scientific purposes or for recreational and educational use; provenance collections … usually purport to determine the most suitable seed source for the afforestation of specific areas … and clone archives (or 'tree shows') are normally designed to test the productive capacity of a restricted number of genotypes (selected from currently desirable phenotypes) over an economic rotation.[31]

The most intensive experimentation was carried out by the Commonwealth Forest Research Institute, based in Canberra. From the early 1940s some thirty arboreta for research purposes were established at a range of altitudes in the Australian Capital Territory (ACT) and on the Riverina plains at Jerilderie. Students and scientists actively used these sites for training and research.[32] By the end of the twentieth century they had largely become amenity sites, though data were still being collected on growth rates by volunteers. The measurement of growth rates and comparison of performance of the potential commercial species was, however, meticulously documented through much of their life.[33] Sadly all but one of these arboreta were destroyed by fires in 2003.

The results of the trials led to *Pinus radiata* being the preferred softwood species for introduction in many parts of Australia. In turn, breeding programmes, based on diverse selections from the original genetic stock, led to both progeny and clonal trials. There has been an economic benefit from this work, as the large-scale industries based on this species in Australia, and even more so in New Zealand, attest.

ARBORETA IN THE LATE TWENTIETH AND EARLY TWENTY-FIRST CENTURIES

> It is, indeed, on the evidence provided by arboretum-type plantings that most of the man-made forests of the world – amounting to more than 50 million hectares – have been created.[34]

Since Richardson's words (see above), that area has been multiplied many times and almost all the man-made forests are those 'proved up' in arboreta, especially Monterey pines (*Pinus radiata*), blue gums (*Eucalyptus globulus*) and teak (*Tectona grandis*).

Towards the end of the twentieth century we have witnessed a new wave of interest in the creation of arboreta and public botanic gardens (which serve many of the functions of arboreta) in Australia. Over the last two decades, private individuals, local governments and several State Governments have invested heavily in such projects. Townsville

Palmatum (Queensland), Currency Creek Arboretum (South Australia), the Tasmanian Arboretum at Devonport, and the Olive Pink Botanic Garden (Northern Territory) have been created: all would meet most definitions of arboreta. In a number of instances these have been driven by passionate individuals, often plant collectors, and generally focused on Australian plants. However, one very large-scale project, 'The Canberra International Arboretum', recently commenced. It is to be developed on a central site in the capital, and will feature over 280 hectares of trees representing '100 forests of the world'. This project, while very focused on its role as an amenity garden, has links with forestry researchers at the Australian National University and so may continue the nexus with scientific research into the future. There is also a scientific/didactic role in showing which trees will perform best in a drying climate, thereby contributing to the trial function of an arboretum.

CONCLUSIONS

Historically, arboreta in Australia have played a central role in plant introduction and evaluation. Early botanic and acclimatization gardens, driven by the ideas of plantation settlements of Empire, received and exchanged trees and other plants under the direction of people largely trained or connected to Kew. In addition, plant exchange and introduction were going on with other parts of the British Empire, particularly where there were similar gardens, as carefully documented by Donal McCracken.[35] The idea of 'colonial plantations' demanded active plant introduction and initially at least this was seen to be the prerogative of government. Later, private individuals took up 'plant acclimatisation'. When wealth accumulated in the colonies, individuals undertook the establishment of private arboreta as part of mid-nineteenth-century gardening fashion. By the late nineteenth century in Australia, botanic gardens were becoming the pleasure reserves for amenity purposes they now are, while most acclimatization gardens disappeared or morphed into other gardens as the ecological idea behind them fell into disrepute. When forestry became a professional discipline, with institutional rather than trade training, the science of tree introduction and improvement began to take over. A new wave of arboreta emerged. In Australia this also intersected with the ideas of the garden city and in Canberra, particularly, the concept of the city as arboretum was explored by Griffin and Weston.

The development of arboreta over a 170-year period has provided much scientific knowledge about the growth and performance, from an economic point of view, of tree species and cultivars. The whole process of species trials and the manner in which they should be carried out was revived as a major project of international silviculture after the Second World War. The Food and Agriculture Organisation (FAO) held meetings and produced manuals on techniques for the establishment of trial arboreta, with an aim of improving timber and firewood production in Third World countries.[36] In some instances this has led to economic benefits as the species selected provided substantial industries. Major plantation industries based on introduced conifers initially came from this scientific research. Subsequently, tree breeding of the selected species led to new advances in developed cultivars of some of these species, some of which in turn have been exported to develop forest industries elsewhere. Arboreta have been very helpful in guiding the development of amenity species for both public spaces and private use. In other instances, it has led to serious plant invasions of species now considered 'weedy' leading to unintended consequences.

While arboreta in Australia today are largely 'places where trees and shrubs are grown for pleasure and instruction', the trajectory of these institutions is firmly grounded

in their 'links with botanical gardens, the horticultural trade and the scientific development of forestry'.[37] The initial motivation to create these sites was to investigate the economy of trees and tree production. At all times there has been an interest in putting trees on trial.

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