



PlantNet

*The Plant Collections
Network of Britain &
Ireland*

Design and Display of Plant Collections

Based on a PlantNet conference at the
Royal Horticultural Society Garden Rosemoor

22–24 April 2002



Design and Display of Plant Collections

Based on a PlantNet conference at the
Royal Horticultural Society Garden Rosemoor
22–24 April 2002

Matthew Jebb & Judith Cheney

This publication is based upon a PlantNet conference held at Rosemoor, but also includes up-to-date information and comments. The phraseology and opinions set out are entirely the compilers' interpretations and should not be construed as speakers' opinions.

The document is neither a comprehensive review of design and display of plant collections, nor an exact transcript of the conference. Notes are provided on the talks given at the conference, and themed chapters point readers towards practical experience and other information.

Design and Display of Plant Collections

Based on a Plantnet conference at the Royal Horticultural Society
Garden Rosemoor on 22–24 April 2002.

Matthew Jebb & Judith Cheney.

Published by PlantNet 2004.

© *PlantNet: The Plant Collections Network of Britain and Ireland,*
2004.

Our thanks go to all those who made the conference such a success, to:
Christopher Bailes, Sarah Chesters and the staff of the RHS Garden
Rosemoor for their help in organising the conference and the visits to
gardens; Ian Martin at the Eden Project for organising the pre-
conference tour of gardens in Cornwall; all the speakers at the
conference; all the owners of the gardens visited and the Head
Gardeners who gave us guided tours; the delegates who attended the
conference.

PlantNet is grateful to the John Spedan Lewis Foundation for funding
the publication and distribution of this booklet.

Contents

	<i>page</i>
Introduction	1
Themes	
Authenticity and history	3
Natural and ecological	5
Conservation	8
Plants and planting	10
Spectacle and 'wow-factor'	14
Seasons and festivals	16
Education, research and self discovery	18
Structures and features	20
Notes on conference talks	
1 Plants are boring! So why have 1.5 million people visited the Eden Project? <i>Peter Thoday</i>	22
2 Does authenticity matter? <i>John Watkins</i>	23
3 The evolving arboretum <i>Mark Flanagan</i>	25
4 Never work with children or animals <i>Mark Sparrow</i>	27
5 Plot or prairie? <i>James Hitchmough</i>	28
6 New trends in glasshouse planting <i>Wolfgang Bopp</i>	30
7 Phytogeographically correct! Chilean and Bhutanese collections at Benmore <i>Peter Baxter</i>	31

8	Restoring order to the family beds <i>Matthew Jebb</i>	32
9	The Vegetable Kingdom <i>Alan Gear</i>	34
10	Heritage vegetables at West Dean <i>Jim Buckland</i>	35
11	Community displays at the University of Dundee Botanic Garden <i>Alasdair Hood</i>	36
12	Historical accuracy – or how to go grey in three easy lessons! <i>David Avery</i>	37
13	Terror firma – creating a garden with bedrock <i>Simon Goodenough</i>	39
14	Collection planning with the Rosemoor masterplan <i>Christopher Bailes</i>	40
15	Summing up <i>Simon Thornton-Wood</i>	41

Garden visits

16	Pre-conference tour	43
17	Visits during the conference	45

Indexes

Gardens	46
Topics	47

Introduction

Gardens have many different purposes: attracting visitors, displaying plant diversity, conservation, education, teaching, research, tranquillity, heritage, and both human and plant history. Most need to take account of several, if not all, of these aspects in the design and display of their collections. The purpose of this conference was not to examine the current paradigm or fashions of plant display, but to bring together practical examples of how plants have been and are presented today. Interpretation and garden design are two vital facets of plant display, but this booklet covers neither of these. It is neither a comprehensive review of design and display of plant collections, nor an exact transcript of the conference. Instead, we hope this publication will provide a snapshot of some of the ideas being considered in the early years of this century.

In the first half of the booklet, current innovations and ideas are explored through eight themes, which are cross-referenced to the talks given at the conference. The superscript numbers in the text refer to the notes on talks and garden visits given in the second half of the booklet. Although similar ideas are discussed under theme headings, there are many overlaps between themes and most topics could have been considered under several themes. We leave readers to make their own connections.

The balance between the different themes will be different in every garden, but all depend on the response of different kinds of visitors. Fashions in design and planting change. Each theme could be the basis for several conferences, only a few aspects of each are considered here. Numerous examples could be chosen to illustrate the points discussed, but there was only space to cite a few here.

Every year, PlantNet runs a number of conferences on different themes. Many interesting synergies emerge from quite unrelated topics, simply because they all return to the central theme – the plants we grow. Various subjects related to display have been considered in recent years: *Training in Heritage and Botanical Horticulture* at Writtle College, *Gardens as Visitor Attractions* at Bangor, *Glasshouses: Old Structures, New Growth* at Sheffield Botanical Gardens, and *Implementing the Global Strategy for Plant Conservation* at University of Reading. Future

conferences will look at management and maintenance of water gardens and the heritage value of plant collections.

PlantNet also promotes three informal forums: the Tree Forum, Plant Records Group and Glasshouse Forum, each one holding regular, practical workshops. The exchange of ideas and experience at these meetings promotes both excellence and career development for our many members. In recent years, we have also begun a series of technical training days, when small groups of members have the opportunity to gain valuable insights and training in specialised areas of botanical horticulture.

The PlantNet conference *Design and Display of Plant Collections* held at Rosemoor in 2002 was attended by nearly 80 people and consisted of talks, discussion and visits to gardens. This publication is based upon that conference but also includes up-to-date information and comments. The phraseology and opinions set out are entirely the compilers' own interpretations and should not be construed as speakers' opinions.

The idea of producing a booklet arising from the conference was to provide PlantNet members with a useful resource and to encourage further discussion. PlantNet is most grateful to the John Spedan Lewis Foundation for funding its production.

Matthew Jebb
National Botanic Gardens, Glasnevin

Judith Cheney
PlantNet Administrator

March 2004

Superscript numbers in the text refer to the notes on talks and garden visits at the conference given in the second half of the booklet, and as numbered on the Contents pages.

Authenticity and history

In recent years there has been the money and drive for restoration of Gardens to a specific period in their history (Heritage Lottery Fund in the UK, Great Gardens of Ireland Restoration scheme). Whilst such activities are of merit in the funding and redevelopment that ensues, they are also much criticised. We are all well aware that the one unique feature of a garden is how it constantly grows, both philosophically and organically. It is one of the least static pieces of our heritage. And yet we still need to look at the Victorian, Georgian, or even Roman, approach to gardening if we want to understand how our modern approaches have developed. The issue of authenticity can thus become a subject not only for clear agreement, but also for healthy conflict.

As John Watkins said, ‘history began a second ago’². So, what is authentic in a garden? At Charles Darwin’s family home, Down House in Kent, English Heritage has re-created, as far as possible, a faithful restoration of the interior of the house as it was in Darwin’s day. In the garden, there was the difficulty of deciding upon a basis for what was important, and authentic. Making sure that all hedges were grown from original surviving material in the garden was one such attempt. Of particular importance, from a historical point of view, was the reconstruction of the famous Sand Walk. Every day, Darwin took a circular walk around the house while he pondered his theory of natural selection and other scientific writings. The glimpses he got of the house, the fence that marked the way, all these were considered essential elements of such a historic reconstruction. There may be no evidence that allows this path to be anything but an approximation, but the aim was to re-create the essence, and hopefully the inspiration, of his daily walk². Similarly, in the glasshouses, plants that Darwin worked on at various times in his career – insectivorous, climbing – are now grown together, but these probably never grew there all at once. However, they serve a role today in exemplifying a composite history.

Thus, there will always be this spectrum of authenticity from general layout or composition, to very specific usage of the right plants. In many historical reconstructions of gardens, the importance of using the right cultivars, from the right period, is adhered to faithfully. And yet, at the same time, we should never forget that Gertrude Jekyll, for instance, could well have fallen upon many a modern cultivar with delight. The

dominance of modern taste is probably one of the few factors that would override the often startlingly bright colours that would have made up Victorian bedding. At Brodsworth Hall ¹², authentic vibrantly coloured cultivars of bedding plants are being sought for the ribbon planting in the restored flower garden and self-set trees in the woodland garden are being cleared to make way for choice species available to the Victorians. The Dahlia Walk at Biddulph Grange, filled in around 1920 and only rediscovered after excavations in 1988, has been restored and replanted with dahlias similar to the original cultivars, which are now extinct. At the National Botanic Gardens, Glasnevin, two floral carpets have been laid out for over a century, the design being changed only once – for the 900th anniversary, in 1988, of the founding of Dublin city.

Every garden is unique, and the balance between accuracy and entertainment is a useful dynamic. After all, most historic gardens were not built for the general public – this has simply become a necessary add-on ¹². At Trewithen ¹⁶, the grand vista was designed to be viewed solely from the front of the house, so as to provide a receding panorama of shapes and colours along the lawn. It was originally planned to be at its best for a concentrated period of 6 weeks in the spring. The eighteenth-century kernel of the garden has today been developed as a woodland garden, extending the period of interest for visitors.

Authenticity in a garden may thus be confined to style ('contemporary heritage gardens'), design (an exact copy), contents (the same types of plants, the same cultivars, or even the same clones), or simply a theme. All these elements are authentic in their different ways, a happy melding of the past with contemporary features. The approach to laying out order beds provides just such an example, where the authenticity of a historically redundant system can be more educational than the newly perceived authenticity of DNA science ⁸.

Authentic restoration involves many compromises, to take account of modern growing conditions and health and safety regulations in the context of access and faithful restoration.

So-called 'naturalised' or 'naturalistic' planting is not really authentic in the sense of being an exact replica of a habitat or wild assemblage, but rather an abstracted form of natural, for a particular purpose.

Natural and ecological

Today, many gardens consider the educational possibilities of new plantings almost before any other practicalities. Historically, garden design has swung to and fro between a rigid structure of bedding and parterres to the other extreme of picturesque landscapes. Rock gardens, ferneries and bog gardens are some of the oldest attempts to emulate a habitat for the purpose of cultivation.

Attempting to re-create a habitat or an association of geographically or ecologically associated plants has become more frequent in large collections^{7, 11}. Such displays range from the intricately faithful to a simple association of plants from the same habitat. Reconstructing the physical habitat is often expensive. At the National Botanic Garden of Wales, a canyon in the Great Glasshouse was designed by an artist, with an eye for clean, sharp lines⁶. Thus, while inspired by nature, it is very far from it. Trying to copy a natural rock face, wall or scree slope can be extremely difficult, both to avoid it becoming twee on the one hand, or phenomenally expensive on the other. The Evolution House at Kew is probably one of the most ambitious reconstructions of land-plant evolution. Whilst it is an undoubted success, such a theatrical setting does not come cheap.

During the construction of the rocky underpass at Rosemoor, a particularly large block of stone fell into the 'wrong' place, but was readily incorporated into what all agreed was a perfectly satisfactory arrangement¹⁷. Such accidental design is something we nearly always accept in our tree planting, for example. The degree to which trees are trained is a vital part of Japanese gardening philosophy, even beyond the bonsai pot. Trees of *Cercidophyllum*, for example, are usually trained into a single-trunked specimen in Japan, whilst in Europe we don't even question the multi-trunked habit the tree seems to want to develop. Most trees are accidents in their design, and there is a healthy debate between those wishing to see the tree express itself, and the notion of careful early training. Planting trees in small clusters, to encourage upright growth, is becoming more prevalent in many gardens, and even in public car parks small clusters of oaks are becoming a common sight.

The new approach to 'monolithing' dead trees, for their aesthetics, or for the promotion of the rich diversity of biota that flourishes in and on dead

wood, is becoming more frequent³. Logs and old tree stumps are often left to become colonised by mosses, ferns, fungi and insects, simulating natural woodland, rather than being removed to give a neat and tidy appearance. At Benmore, the Native Woodland Area is being managed as a moss and lichen sanctuary to show typical Atlantic woodland of western Scotland⁷.

Trying to re-create a habitat or vegetation type such as prairie⁵ requires a combination of both hands-off and intensive gardening to achieve a natural look. In James Hitchmough's experimental work on establishing exotic prairie grasslands⁵, an understanding of the natural ecology of these plants has proved vital, as has the use of different techniques to establish and maintain the plants. Even when all these methods are followed, it seems that site-specific factors are still often overriding.

Displaying native flora is no easy task, and methods of management differ. At Treborth Botanic Garden, Bangor, a careful regime is maintained of cutting areas of grassland, each of which naturally develops a distinct climax of herbs. Experimentation with varied mowing regimes has allowed different native swards to develop within a small area. At Glasnevin, ecological plantings of native plants have been allowed to take their chances: whilst some arrangements thrive, others show an alarming rate of decline. Maintaining a set of maritime plants in pots plunged into a shingle bed is showing great promise as one means of natural-looking control. Two of Ireland's rarest native plants have, meanwhile, naturalised themselves just off this bed, on the edge of a path.

Natural habitats are not static, and maintaining habitat plantings can present management dilemmas. At University of Dundee Botanic Garden¹¹, the establishment of a number of vegetation types simulating a rocky streamside glen has been very successful in providing a physical succession of habitats from montane to coastal. But these plantings need management. Excessive growth has required a constant programme of thinning and removals. In other parts of the Garden there are examples of birch, oak and pine woodland planted 30 years ago. Should they be thinned so that typical understorey plants can thrive, or should they be left to mature?

Cambridge University Botanic Garden has a wonderful collection of British native species in habitat displays of chalk and limestone areas,

and the Breckland and the Fens. These are labour intensive to manage and maintain and to keep the plants clearly labelled: a delicate balance has to be struck between leaving plants to seed naturally and ensuring that small plants are not swamped by more vigorous ones. A typical Cambridgeshire hedgerow planted in the Garden is managed traditionally by laying it every 8 years, to maintain a dense, effective barrier and a nesting site for birds.

Trying to re-create a limestone pavement at Glasnevin has led to the problem of excessive fertility. The balance between healthy plants and low soil fertility to discourage rampant growth of grasses is a regular problem for any self-sustaining natural system. Wildflower meadows require carefully timed mowing regimes if a constant balance is to be preserved, particularly successful at Rowallane in Northern Ireland. At Westonbirt Arboretum, different cutting and grazing regimes have a marked effect on the display of flora on the chalk grassland area on the downland slopes. Here and in the Silk Wood the grassland has to be managed for both an interesting flora and access for visitors.

At Benmore Botanic Garden, major plantings of Chilean rainforest and Bhutanese vegetation types have been developed with wild-collected plants representing several habitats⁷. Planting in animal enclosures in zoos is based on the natural habitats of the animals, but it can be difficult to find plants that will withstand pressure from the animals and will thrive in our climate⁴.

Window dressing can be important in improving presentation. At Eden, displays of Mediterranean vegetation types – which lack the ‘wow factor’ of the tropics – have been complemented with artwork directly associated with or inspired by the habitat or by the plants themselves¹⁶. At the National Botanic Garden of Wales, the use of burnt gorse stems scattered amongst the fire-climax vegetation types in the Great Glasshouse provided a useful and dramatic background to the living plants⁶. ‘Naturalistic’ displays in glasshouses convey a more realistic impression of plants in the wild than displays in pots on benches, but they are approximations rather than accurate representations of habitats. Cactus and succulent displays under glass, for example, are much more densely and diversely planted than occurs in the wild.

Conservation

Since the 1970s, conservation has become an increasing concern of botanic gardens. The adoption in 2002 of the *Global Strategy for Plant Conservation* as part of the Convention on Biological Diversity has given new impetus to the display of conservation collections of plant species, particularly in relation to raising public awareness of the importance of plant diversity and the need for its conservation. There is much to tell the public not only about the plants in their local flora, but also about research and species recovery work being carried out on threatened species. Gardens, with their collections of plants from all over the world, are concerned with conservation not only of native flora, but also of exotic species.

Botanic gardens have *ex situ* collections of species threatened in the wild, but the plants are not necessarily displayed together for the public. Some of the plants are not showy, and special skills are needed to display such collections effectively. Not all of the plants in conservation collections are suitable for direct use in re-introduction programmes, for various reasons, but they can be used to tell people about the research and conservation work being carried out.

The habitat plantings at Cambridge University Botanic Garden and University of Dundee Botanic Garden¹¹ show how attractive displays of local flora can be. The University of Bristol Botanic Garden has a display of plants rare or threatened in the local flora. Logan Botanic Garden has a display of plants of the Galloway coastline, including some rarities. A notice is to be displayed by the limestone rock garden at RHS Harlow Carr, drawing attention to the Limestone Pavement Habitat Action Plan and explaining that it is no longer acceptable to use rock from natural areas of limestone pavements for gardens.

Fern collections displayed in ferneries in gardens and under glass to such dramatic effect have the potential for use in promoting an interest in this group of plants and raising awareness of the need for their conservation. Britain and Ireland are particularly important in an international context for bryophytes and lichens. About 65% of the known European bryophyte flora occurs in the UK. Attention is being drawn to such flora at Benmore, Dawyck and Wakehurst Place.

Zoological gardens regard plant conservation as vital, highlighting the interdependence of plants and animals and working in partnership with others. They grow rare and endangered plant species, native and foreign. Bristol Zoo Gardens has a new display of some of the rare plants of the Avon Gorge, as part of the Avon Gorge & Downs Wildlife Project, launched in 1999. Chester Zoo ⁴ has a collection of pleurothallid orchids, making a striking display, and another of cacti and succulents.

Displays of cultivars and species of a single genus all together pose their own problems in preventing hybridisation and in providing different growing conditions for different species. The National Council for the Conservation of Plants and Gardens now holds more than 640 National Collections. The planting of cultivars in the National Fruit Collection at Brogdale has to take account of pollinators and compatibility, for the various groups of apples and pears, for example.

Increasing attention is being paid to managing gardens and landscapes for their 'natural' flora and wildlife. Many have *in situ* species of conservation interest. Some gardens include special reserves, as at Wakehurst Place and Down House. Treborth Botanic Garden includes 1.5 ha of mixed woodlands, parts of which are designated ancient woodland and notified as a Site of Special Scientific Interest. The Silk Wood at Westonbirt Arboretum includes areas of ancient semi-natural woodland. These woodlands are of great interest for scientific study, but need careful management.

In some historic gardens, management or neglect over many years have resulted in areas of floral diversity and interest in landscapes within the garden. The lack of close cutting or use of herbicides on the lawns at Brodsworth ¹² has resulted in the persistence of a rich grassland flora on magnesian limestone, which is now being carefully managed in restoration of the garden. Meadows at Rowallane are full of wild flowers as a result of a careful cutting regime over many years.

The International Conifer Conservation Programme at the Royal Botanic Garden Edinburgh involves the growth of conservation collections at a number of sites in Britain and Ireland. They are often spectacular features which give the opportunity to convey information to visitors about the threats to these species in the wild.

Plants and planting

The plants in our collections of course underlie all the other themes discussed in this booklet. Some traditional styles of display are being revived, while others are reassessed and interpreted in a modern context.

Trees

Some of the great arboreta from the eighteenth and nineteenth centuries were planted for the aesthetics of the landscape or of individual specimen trees³. Others were planted as scientific collections. There was great excitement about new introductions from far away places, though it was not known how well or how large many of these species would grow. Today, many of the early introductions are reaching maturity; some are now rare in the wild and will need to be propagated to keep them in cultivation. Maturity and loss of trees in severe storms in the late twentieth century have given arboreta the opportunity to consider alternative planting designs based on taxonomic groupings, geographic origin, aesthetics or where particular species will thrive best. Often, the choice is a compromise among the different options, as the purpose and conditions of the arboreta have changed over the years. At Wakehurst Place, planting is in a geographical arrangement to form 'a walk through the woodlands of the world'. Plants from six distinct geographical regions of the World are featured at the University of Oxford Harcourt Arboretum, as 'plants from high places'. At Sheffield Park in Sussex, some 9000 native and exotic trees and shrubs are being planted to replace those lost in storms and to evaluate their response to climate change.

Avenues have long been a traditional way of planting trees, and today we enjoy the vision of those who planted them more than a century ago. The redwood avenue of *Sequoiadendron giganteum*, planted in 1863, makes a spectacular entrance to Benmore Botanic Garden³. The yew avenue Addison's Walk at Glasnevin predates the founding of the Botanic Gardens. Restoration of the arboreteum at Kilmacurragh, Co. Wexford, has revealed a magnificent yew avenue wide enough for two carriages to drive side by side, a broad oak avenue and another of *Rhododendron arboreum* – an amazing site when in flower with a red carpet of fallen flowers beneath. The avenue of mature monkey puzzles, *Araucaria araucana*, is a striking feature at Bickton Park Botanic Garden. At Knightshayes, a grove of Douglas firs, *Pseudotsuga menziesii*,

planted as an avenue in the 1870s, is now reaching 150 feet. At Biddulph Grange, the underplanting of the lime avenue on the western boundary has been restored, with dark-green ivy trained into scalloped shapes to imitate the shadows cast by the trees.

As historic avenues reach maturity and beyond, their management becomes a dilemma. Vistas and focal points may be obscured by large trees; some trees are past their best sooner than others, and decisions have to be taken about whether to interplant to replace individual trees or whether to restore the whole avenue in one go. These alternatives are being considered at Westonbirt Arboretum. At Biddulph Grange, an avenue of *Sequoiadendron giganteum* was planted around 1860 alternating with *Cedrus deodara* which were to be removed after 20 years as the redwoods matured; but, when the time came, the redwoods were felled instead of the cedars! In 1996, the bold decision was taken to remove all the remaining trees and restore the whole avenue in one go. The original design was replicated, replanting *S. giganteum* and *C. deodara* backed by a yew hedge, with *Aesculus x carnea* grafted from the original trees on embanked terraces set against dark *Pinus nigra*, to form a grand and unusual multilayered avenue. At Dunham Massey, some 1500–2000 trees are being planted as part of major restoration of oak and beech avenues in the eighteenth-century landscape.

Among recently planted avenues are a 120-foot length of *Metasequoia glyptostroboides* planted to mark the 50th anniversary of the Sir Harold Hillier Gardens and Arboretum in 2003; and an avenue of *Quercus frainetto* at the Royal Horticultural Society Garden Hyde Hall.

Lower plants

A revival of interest in ferns has led to restoration of the Victorian fern grotto at Greenway in Devon, replanted with native and exotic species. An early fernery established by 1843 on a rocky site at Bicton Park Botanical Gardens has been replanted with a new collection of ferns. At Brodsworth Hall, the extensive fern collection of Eric Baker, donated by his widow, has been planted in a restored rocky dell¹². There are thriving collections of ferns under glass at Glasnevin, Ascog Fernery and West Dean, to name but a few. The Cool Fernery (a glasshouse dating from 1863) at Chelsea Physic Garden has been restored. Tree ferns, a feature in gardens in western Britain and Ireland for many years, have become fashionable trendy plants. At Logan Botanic Garden, many

of the 60 specimens of *Dicksonia antarctica* planted in a new Tasmanian Glade are self-sown seedlings from mature specimens grown in the Garden.

A moss and lichen sanctuary being developed in 'elfin forest' near the ruined fernery at Benmore Botanic Garden complements the Cryptogamic Gardens at Dawyck and the main Royal Botanic Garden Edinburgh. The Frances Rose Reserve on sandstone outcrops at Wakehurst Place was opened in 2003 as a new reserve for mosses, liverworts, lichens and filmy ferns. In the Moss House at the Firs Botanical Grounds, University of Manchester, mosses, liverworts and filmy ferns are grown under glass; the plants used to stock the original moss house were collected from Skibereen in Co. Cork in 1909–16. There is scope for using all these collections to raise public awareness of the diversity of lower plants and the need for their conservation.

Bedding

Traditional carpet bedding is still meticulously set out at Glasnevin and on the purpose-designed slopes at Cragside. At RHS Wisley, an elaborate design of carpet bedding is made more informative by a small carpet bed of labelled plants forming a key to the main design. The style is given a modern interpretation every year at Waddesdon, where the bedding is planted to contemporary designs by fashion designers and other well-known artists.

A revival of interest in summer bedding schemes has led to the growth of half-hardy exotics, such as *Canna* and *Musa*, in semi-tropical bedding. At West Dean ¹⁰, a series of Victorian beds has been restored in traditional shapes with geometric polychromatic planting, but given a new twist by the use of novel planting combinations, such as parsley and petunias, and beetroot and begonias.

Grasses

Grass species are displayed in different ways: in order beds; as decorative horticultural features; and in traditional and contemporary meadows and swards, with native wild flowers or exotics ⁵. These various displays give a range of opportunities for interpretation and conveying information on one of the largest plant families. The Glorious Grasses display at Chester Zoo ⁴ features grass species of major importance in five sections, each with interpretation: cereals and other

economic crops, bamboos, turf, sand dunes and ornamentals. Bamboo gardens at Kew and Cambridge (a collection dating from 1879) have been restored. Three displays on rice are being set up in the Humid Tropics Biome at the Eden Project ¹⁶ to celebrate the International Year of Rice in 2004. In lawns in botanic gardens, the diversity of species may, to a certain extent, be of greater interest than the completely smooth weed-free monoculture sought after in a purely decorative garden.

Fruit and vegetables

Hardy and exotic fruits – from apples and pears to peaches, apricots and pineapples – are once again being grown in walled kitchen gardens, orchards and glasshouses, along with soft fruits, vegetables and herbs. The emphasis may be on demonstrating traditional training and cultivation techniques for productivity, as at Heligan ¹⁶ and Tatton Park; for decorative display, as in potagers; or on cultivars as at Brogdale and at the Vegetable Kingdom ⁹ at the Henry Doubleday Research Association. In the Plot to Plate scheme, the National Trust is comparing past and present techniques and tastes of modern and traditional cultivars grown in some of its walled gardens. Vegetable plots created by students at Kew have been on show to the public in recent years. A new fruit garden is being developed at RHS Harlow Carr, which is also known for its collection of rhubarb cultivars. A comprehensive collection of Scottish fruit cultivars is being developed at Fyvie Castle, by the National Trust for Scotland.

Medicinal plants

Botanic gardens were originally physic gardens for teaching medical students about medicinal properties of plants. Chelsea Physic Garden, dating from 1673, continues to display such plants in the Garden of World Medicine developed in 1993 and the Pharmaceutical Garden developed in 1999. The Chinese Medicinal Herb Garden set up at the University of Bristol Botanic Garden in 2000 is used for teaching medical students about Chinese and traditional herbal medicines. The design combines elements of classical Chinese gardens with medicinal plants laid out according to traditional herbal use.

Spectacle and ‘wow factor’

Buildings and gardens

The geodesic dome of Eden ¹⁶ has come to symbolise a runaway success story. Such an iconic building is now unmistakably associated with the garden. When Richard Turner’s curvilinear glasshouse at Glasnevin was restored in 1995, scrap iron from another of his buildings – the great Palm House at Kew – was shipped back to Dublin. This truthfulness in restoration, using the very same iron that once passed through Turner’s foundry, was all part of the ‘wow factor’ of the restoration. The glasshouse now features as a 40-foot-long, back-lit photograph in the new arrivals wing of Dublin Airport, symbolising the economic revival of Ireland.

Some large and well-known gardens may have no single icon, but have many spectacular features, as, for example, at Kew, Edinburgh and Wisley. The recognition of Kew as a World Heritage Site, not only for its buildings and landscape but also for its plant collections and research, carries tremendous cache as a novel wow-factor.

Even a name alone can become iconic, such as the *Lost Gardens of Heligan*, which embodies both an idea and a philosophy – how to keep a found garden lost? A decision was made to leave all dead timber standing in the Jungle and Lost Valley, since there are only two choices when it comes to tidying up or pruning – full pruning or no pruning, a half-pruned dead tree being a pointless situation ¹⁶.

Spectacular plants and planting

Growing plants as icons can be hindered by time. The avenue of giant redwoods at Benmore, planted in 1863, has become one of its greatest features ⁷, and yet the planning for such a feature seems well beyond the time frame of any management plan today. The spectacle of large plants, from mature trees to climbers, attracts visitors. The walled kitchen garden at West Dean, on the other hand, grows a spectacular profusion of over 100 varieties of tomatoes and chillies as well as aubergines, coleus, annuals and other plants for the art classes at the College ¹⁰. The ox-eye daisies grown *en masse* in the garden and in St Roches Arboretum at West Dean similarly demonstrate how an ordinary and well-known plant can become a

significant feature. The Victorians flocked to see collections of exotics under glass. In more recent times, crowds have queued up to see the century plant go through the roof at University of Oxford Botanic Garden, to see – and smell – *Amorphophallus titanum* in flower at Kew, or to marvel at *Victoria amazonica* at Durham University Botanic Garden. Visitors come every year to see the spectacle of the jade vine, *Strongylodon macrobotrys*, in flower at Cambridge University Botanic Garden. Mass plantings of snowdrops or bluebells attract crowds to many gardens in spring. There are countless other examples.

Colour and light

Foliage colour is a spectacle in many gardens and arboreta: from the fresh green of unfurling leaves in spring to fiery autumn colours. The University of Oxford Botanic Garden mounted an exhibit on colour in plants for the RHS Chelsea Flower Show, subsequently shown in the Botanic Garden. Colour was the theme of the summer festival at Kew in 2002.

Rhododendrons and camellias provide amazing displays of flower colour in spring. Thousands of evergreen azaleas in the Punch Bowl at the Valley Gardens of Windsor Great Park are a spectacular sight in flower. The Rainbow at Biddulph Grange has been replanted with azaleas in distinct bands of colour on a semicircular bank.

The night-lit winter walk at Westonbirt has become an enchanting and popular spectacle, regularly reported in the national press: in November and December 1000 theatre spotlights turn part of the arboretum into an illuminated trail through the trees, lighting up mature trees from below and highlighting the silhouettes and branch tracery. Other gardens have followed suit. Abbotsbury Subtropical Gardens are lit up in different colours to highlight architectural foliage, textured bark and distant views. At Kew, the Princess of Wales Conservatory is lit up and the Palm House is transformed by illumination and reflected in the pond, trees along the Broad Walk are lit up from below. The Palm House at Belfast Botanic Garden is candlelit within, and feature plants in the Tropical Ravine are spot lit with coloured lamps. Buildings and glasshouses at Birmingham Botanical Gardens & Glasshouses have been lit to magical effect.

Seasons and festivals

Our standard idea of a garden is one in which there is a sequence of interest throughout the year: spring blossom, summer flowers, autumn colour and winter bark. There has also been a long history of specialised plant collections that bloom for only a short period of the year. Some gardens were only lived in for a brief period: Trewithen was planted to look spectacular from the house for just six weeks, when the owners would come to see the rhododendrons in flower¹⁶. The entire garden was designed to be viewed from just a short stretch of terrace in front of the house.

Nowadays, gardens seek to attract visitors throughout the year and to encourage repeat visits by promoting a series of seasonal displays and special events. Orchid festivals have proved a great success in botanic gardens at Kew, Glasgow, Cambridge, RHS Wisley, Chester Zoo and elsewhere, attracting visitors early in the year. Mass displays of snowdrops, bluebells, crocuses and narcissi draw in the crowds. The spring flowerings of bluebells and crocuses have been turned into massive displays at Kew, with 1½ million crocuses near the Temple of Belona. All attract national and local press coverage. Flowering of magnolias at Westonbirt has been included in weather forecasts on television. Flowering rhododendrons and camellias bring people to Cornish gardens in late spring every year.

To the traditional summer features of herbaceous borders, bedding and rose gardens must now be added dry gardens in areas with low annual rainfall. The dry garden at Cambridge University Botanic Garden is planted as a typical south-facing domestic back garden, planted with over 100 species and cultivars, to demonstrate what can be achieved without watering. Dry gardens at RHS Hyde Hall and RHS Rosemoor¹⁷ feature plants from the Mediterranean, Australasia and South Africa, adapted to conserve moisture. Displays of arable weeds on field margins and in cornfields have been another summer attraction at the University Botanic Gardens in Durham and Cambridge, and at Kew.

The idea of bringing together plants that are at their best in the heart of winter has been used by many gardens. The present Winter Garden at Cambridge University Botanic Garden, planted in 1979 to provide winter interest remains attractive from September to April. An extensive

outdoor winter garden was opened at the Sir Harold Hillier Gardens in 1996. The winter spectacle in these gardens is achieved through the use of plants for the silhouettes, texture and form of bark, stem, flower, scent, foliage and fruit. The Holly Walk at Kew, planted by Sir Joseph Hooker over 130 years ago, comes into its own at Christmas, showing the diversity in form and berry colour in more than 135 taxa.

Westonbirt has the best collection of maples in the UK and people flock to see the fiery autumn colours in the *Acer* glade³, but this can mean pressure from huge numbers of visitors in only one short period. The Arboretum is keen to encourage visitors to come throughout the year – to see the wonderful display of bluebells and dandelions flowering together on the woodland margins, or young foliage unfurling in spring. A festival of gardens brings people in to see novel garden designs in the Arboretum for several months in summer. The night-lit winter walk through the trees has become a regular and popular event in winter, attracting much publicity.

Kew has developed a series of themed festivals with special events: the *Go Wild* festival in 2003 celebrated Britain's biodiversity. At West Dean, the *Truly Tomato* and *Chilli Fiesta* have become regular and popular events, bringing in food producers, growers and culinary experts there are displays of over 100 varieties of tomatoes and chillies, respectively¹⁰. Apple days and pumpkin festivals are held all over the country, often wonderfully inventive visual feasts.

Festivals also focus on plant collectors and the introduction of species into cultivation. In 2004, there are special trails and tours at Ness Botanic Gardens, Royal Botanic Garden Edinburgh, RHS Wisley, and elsewhere of the many plants introduced by George Forrest. Similarly, in 1999, conifers and herbaceous plants introduced by David Douglas were highlighted to mark the bicentenary of his birth. There are special collections of plants introduced by Augustine Henry at Glasnevin and in the University of Ulster, Coleraine.

Education, research and self discovery

Education is a fundamental purpose of botanic gardens, from informal and formal education for people of all ages to life-long learning. Currently, there is much discussion on ways of communicating information – guided tours, leaflets or audio tours, for example. There is room to consider only a few points here, related to plant displays.

Interpretation is a vast and difficult subject. The style and information will always suit some, but never all, visitors. One of the surest ways of attracting anyone's attention is simply to intrigue or interest. No matter how interesting a planting feature may seem to us, the growers, if it lacks the grabbing power and isn't noticed, no amount of labelling or interpretation is going to work.

Education in gardens covers a wide range of subjects, from history and heritage to food and shelter. Cambridge Botanic Garden has a Genetics Garden demonstrating aspects of plant variation, development and breeding. The Chronological Bed shows a succession of some of the plants introduced to Britain in various periods since Roman times. Other gardens elsewhere have plantings showing pollination mechanisms or dye plants. All these displays can be used not only in formal education, but also in self-discovery. Plants grown to provide material for art and botanical illustration classes, as at West Dean ¹⁰, are also beautiful to look at and inspirational for other visitors.

Order beds are still used for teaching students taxonomy, particularly in university botanic gardens. It has perhaps been underestimated how much the general public can also discover for themselves from looking at these displays, perhaps in relation to plants they have seen in the wild or in their own gardens or simply from general interest. Most order beds are laid out in rectangular blocks. The Systematic Beds at Cambridge University Botanic Garden are unique, consisting of plants laid out in families in irregular beds of different sizes. Designed in 1845 according to the classification system of Alphonse de Candolle, beds of monocotyledons are arranged in a central oval surrounded by a low hawthorn hedge, with beds of dicotyledonous families arranged clockwise outside the hedged area, forming a feature that is both instructive and decorative. At the University of Oxford Botanic Garden, the Botanical Family Borders laid out in 1844 have recently been

rearranged according to a modern classification system based on molecular data, and planted to combine botanical accuracy and aesthetics. The aim is to demonstrate to visitors that the family borders are a fascinating way of discovering which plants are related to each other and which families supply us with food, fibres and medicine.

Phytogeographical plantings can be areas of self-discovery where people make links between what they have seen for themselves on their travels or on television, though this is aided by interpretative material. Colourful displays of South Africa flora have been planted at the gardens run by the National Trust for Scotland at Inverewe. Ventnor Botanic Garden has established an area of Mediterranean vegetation outdoors, where people can wander among the plants¹³. At Benmore Botanic Garden, the natural features of the hillside have been used to convey an impression of wild habitats in the Bhutanese and Chilean Glades⁷. Chester Zoo has constructed a rocky mountainside landscape to featuring plants from the Southern Andes. Native plants of Chile and Argentina are grouped as they occur in the wild. The six geographic beds at University of Birmingham Botanic Garden are being replanted to be more habitat-specific, and interpretative links are being sought with botanic gardens in the regions chosen.

However, there is still much to do to make the connection between plants seen in cultivation in domestic settings and their situation in the wild. *Davidia* and ginkgo are familiar in gardens or as street trees, but most people have no idea where they come from, what their natural habitat looks like or that they are threatened in the wild. Now that more horticultural botanical staff have the opportunity to see plants in the wild, displays in gardens are becoming more informative.

University of Dundee Botanic Garden was set out from the start to show a number of natural habitats¹¹. The original idea was to show flora and settings that people would be familiar with in the 'natural' landscape far from the Garden. Now the ecological displays need interpretation for visitors to make sense of them.

Research in botanic gardens is usually hidden away behind the scenes, only to be revealed on special days or in science weeks. These studies can be fascinating for the public and highlight the scientific role of botanic gardens.

Structures and features

The buildings in which plant collections are displayed and the structures used to support plants are themselves design features, though not part of this conference. Many have been restored or won awards. The geodesic biomes of Eden are the biggest indoor habitats in the world¹⁶. With its plastic-membrane cells, it is also one of the first non-glass glasshouses. Such an iconic building is the latest of buildings representing a status symbol of the plants within.

On occasions, single plants have been responsible for the construction of buildings. The introduction of certain tropical plants in the seventeenth and eighteenth centuries caused minor flurries of excitement. Probably the greatest inspiration was the Victoria waterlily. The remarkable 6-foot leaves caused a spate of purpose-built Victoria-houses to be built at Kew, Oxford, Dublin and Staunton, following Joseph Paxton's initial success at Chatsworth in flowering the plant in the 1850s.

There are numerous spectacular and historic display glasshouses (the theme of a PlantNet conference at Sheffield in 2003), from the Curvilinear Turner House at Glasnevin, the Palm House at Kew, the Kibble Palace at Glasgow Botanic Gardens, to the Pavilions at Sheffield Botanical Gardens, the Palm House at the Royal Botanic Garden Edinburgh, the Turner House at Belfast Botanic Gardens, and many more. Working estate glasshouses have been beautifully restored at West Dean¹⁰, Audley End and elsewhere. The biomes at Eden as well as the Great Glasshouse at Middleton National Botanic Garden of Wales, the Sheffield Winter Gardens and the Princess of Wales Conservatory at Kew are examples of great modern garden buildings. A vast biome for butterflies is planned near St Albans. A glasshouse bridge spanning the A167 has been proposed for Newcastle Botanic Garden.

Structures such as pagodas, temples and fountains are distinct features in historic gardens, giving them a sense of place. Kew is recognised as a World Heritage Site not only for its historic landscape and buildings, but also for its plant collections and scientific research. Such recognition brings with it special responsibility for maintaining the site, entailing difficult decisions on priorities for management and funding of the component parts.

At Glasnevin an unusual chain tent still supports a collection of wisterias; originally, the central pole was a weeping ash tree. At Brodsworth Hall ¹², A restored curved iron rose pergola runs through a box-edged rose garden planted with nineteenth-century roses.

Rock gardens, once so popular in domestic gardens, are again attracting interest. The recently restored rock garden at Chelsea Physic Garden is the oldest planted rock garden in Europe still on view to the public and is an early example of ecological planting. Dating from 1773, it was constructed for the cultivation of plants that thrive in stony soils, from stonework demolished from the Tower of London; donated chalk, flints and gravels; and lava from an Icelandic volcano brought back as ballast by Sir Joseph Banks's ship the *St Lawrence*. It was later embellished with tufa and corals and a giant clam shell from voyage of *The Endeavour* in 1768–71. The University of Bristol Botanic Garden at Bracken Hill has a good example of a Pulhamite rock garden. The dramatic rock garden and cascades at Craggside are undergoing restoration. The limestone rock garden at Cambridge University Botanic Garden is planted geographically and includes a doline, a natural feature of limestone country.

A grass maze at Cambridge Botanic Garden composed of *Oryzopsis lessoniana*, a species from New Zealand, is an unusual feature popular with children. Based on a classical design related to the Cretan Minotaur, it is replanted every 3–4 years. A new yew maze was planted at Staunton Country Park to mark the Queen's Golden Jubilee in 2002.

Willow or hazel support structures for climbers, as seen in the fruit and vegetable garden at RHS Rosemoor ¹⁷, are both practical and decorative, and can be promoted as examples of recycling and sustainable practices.

Walled gardens are major features in historic gardens. Several have been restored in recent years. Those at Heligan ¹⁶ and Tatton Park show traditional cultivation techniques. The structures of the walled gardens at Osborne House ² and West Dean ¹⁰ have been authentically restored, but the planting is modern. At West Dean, though some plants are grown to be eaten, they also provide visual delight and inspiration for classes at the college.

Notes on the Conference Talks

1 Plants are boring! So why have 1.5 million people visited the Eden Project?

Peter Thoday, Eden Project and Peter Thoday Associates

A garden 'belongs' to the people who look after it, and they enjoy it. We may say that our plantings are important for ecology or conservation or education, but the main reason we enjoy the job is that we like growing plants. Horticultural staff used to work in relative isolation, hidden away behind the palms. Some garden staff don't really like the public, they like the garden best when it's closed, they may even produce lists of plants in flower on Christmas Day, when no-one's there to see them! Some regard the public as a source of income. Others, with an interest in agronomy and science, see the public as damaging to plants and science. The 'evangelists' want to educate and convert the public to plant supporters.

Huge numbers of people visit gardens: 90% come to have a pleasant day out and only 10% come for an informative experience. We also need to have a dialogue with those who *don't* visit gardens, we may get them there under sufferance or misrepresentation. Some visitors come to criticise, others to feed the ducks. Should we try to accommodate them all and then work on them, communicating our messages? We may need a magnet to bring them in, but it is easy to be too pious – too much information on naming, reclassification or horticultural techniques will be over the heads of most of the public, most of whom are neither knowledgeable nor enthusiastic about plants. Not all gardens need a great flood of visitors, some are ill-equipped for lots of casual visitors and may suffer damage if too many come at once. Traditional gardens serve a wide public, but are ill-designed for communication. It could be damaging to turn these gardens upside down in the name of education and interpretation. We need to consider the effects of promotional efforts on such gardens.

The Eden Project recognised the needs of visitors from the outset. What makes a visit to a garden enjoyable? Visitors may like the design of the garden, and the beautiful and interesting plants, *en masse* or as

individual specimens. Amateur gardeners like model gardens, with ideas that they can take away and adapt for their own gardens. The quality of the coffee and cakes are important and so is the design of the shop and the toilets. Why do people come to see *your* garden? They come because they've heard of it and they think it might be interesting. There is a difference between what they enjoy when they get there and why they came in the first place. Architecture may be an important part of the attraction: the biomes at Eden, the Palm House at Kew. A strong landscape is a feature, the plants follow after that.

How to communicate – consider past, present and future:

- Attract: promote the garden to build up a reputation that it's a good place to visit
- Deliver: people have made an effort to visit, so give them good value and a good experience while they're there – tea room, toilets etc.
- Impress: you want people to talk favourably about the garden after they've left and to admire what they saw.

Attract, deliver and impress your visitors, so that they feel like friends, then they will promote the place for you.

How a garden is described by the press will affect its perception by the public. Eden was reported in the *Guardian* as hot, steamy and sexy, under the headline 'How the Garden of Eden became Bond villain's lair'. Compare this with the 1898 guide to the economic botany collections at Kew.

2 Does authenticity matter?

John Watkins, Head of Gardens and Landscape, English Heritage

History started a second ago! It is not only things that happened a long time ago that are interesting. All who are associated with historic gardens are of personal interest: staff as well as rich people and landowners. There is now increasing interest in what went on in life 'below stairs' or 'in the potting shed'.

In the garden of Charles Darwin's home at Down House in Kent, the philosophical view and vista were restored, with many of the elements that inspired and aided Darwin's research. The Sandwalk, Darwin's 'thinking path', was rediscovered. He had made it in 1846, fencing off an area of land, planting it with native trees and making a circular path dressed with sandy gravel at the edge. Old photographs showed such details as how the posts were wired. From these it was possible to re-create a path and posts, but we cannot be certain that it is restored exactly as it was. Some records of plantings remained – there was a large collection of gooseberries – but it was decided in the restoration to produce a facsimile to show the range of plants that Darwin worked on. In the glasshouse, for example, there are orchids, carnivorous plants and climbers. He would not have worked on all these plants at once and so they would not have been grown there all at the same time. Thus, the restoration is not trying to re-create the garden as it was exactly at any one time, but to convey information on what went on there over a period.

In restoring the bedding in the Italian Garden at Brodsworth Hall, it was difficult to find appropriate cultivars – not hybrid pelargoniums or forget-me-nots. In the first instance, beds of the right shape have been re-created and planted up to give the general effect, until more appropriate cultivars can be found.

Queen Victoria visited Osborne House for 50 years, but the garden didn't stay the same for all that time, and so there was a range of designs and plants to choose from in the restoration. The public is drawn in to such gardens because they are nice places to be. Once there, they may be challenged by things that, in their perception, 'don't look right', then they will question what they see and want to find out more. The vegetable plots worked on by Victoria and Albert's children are today laid out with fruit and vegetables that were grown there, but the age range of the children spanned 25 years and so they would not all have been there working in the plots at the same time. Thus, what we see today is not exactly as it was at the time. The walled garden had not been for growing vegetables, but for flowers for the house. The concept of 'contemporary heritage gardens' sound like a contradiction, but these are gardens on a heritage site by modern designers. Rupert Golby's design for the walled garden at Osborne dynamically changes the space, and it allows Debs Goodenough, Head Gardener,

to be creative within the space, with blocks of herbaceous plants and swirls of annuals, giving a spread of flowering time and providing colour and interest for visitors over a long period.

In the walled kitchen garden at Audley End, only the base of the Thomas Rivers's fruit house remained, but records of the design of the glasshouse were discovered in one of the editions of a book by Rivers, enabling the house to be reconstructed.

Eltham Palace is an old site with many layers and so it was difficult to know which period to choose for restoration of the garden. The present house, with superb Art Deco features, was built in the 1930s by Stephen and Virginia Courtald, but it incorporates the Great Hall built for Edward IV in the 1470s. Many photographs remained of the 1930s house. The planting emphasised the stark architecture of the front of the building. The roses were from before the Second World War – no floribundas. There were not many records of the rest of the garden and so it was decided to develop something appropriate for the site today. The 19 acres surrounding the moated and fortified palace include herbaceous borders by the contemporary designer Isabelle van Groeningen, an original rock garden, a formal sunken rose garden and areas of shade-loving and winter-flowering plants.

3 The evolving arboretum

Mark Flanagan, Keeper of the Gardens, Windsor Great Park

Trees are important in ecological terms in landscapes in the wild; deforestation in Sichuan has affected the whole area. Trees define the landscape in Britain, from old oak trees in Sherwood Forest and Windsor Great Park to plantations and woodlands. This was highlighted by the storms in 1987, when so many trees were lost from familiar landscapes, resulting in devastation and a loss of definition. Trees are also of cultural significance. In the storms, Sevenoaks in Kent lost six of the oaks after which it is named.

Aesthetics were important to many of those who planted traditional arboreta. Trees were planted in avenues, with vistas and contrasts in form and colour, as at Westonbirt Arboretum. Some were to adorn the

grounds of a country house, others simply for their beauty and some for future generations to enjoy. At Scone Palace in Perthshire, Douglas firs were planted to evaluate their potential for forestry.

Many arboreta were driven by the excitement of new plants being introduced to Britain from all over the world. A golden age of introductions by plant collectors such as George Forrest, Kingdon Ward, Ernest Wilson and Joseph Rock was followed by a lull in the 1930s, when access was no longer granted to collecting sites in eastern Asia. This was part of a loss of momentum in development and design of gardens and arboreta. In the modern era, restrictions on access were lifted and a programme of reintroductions began, particularly from China and Korea. Nowadays, collection is for clearly defined purposes and according to the Convention on Biological Diversity. Seed is collected in a programme of selection and evaluation in relation to the breadth of the gene pool in wild areas. For example, evaluation of introductions has revealed 100–200 distinct genotypes of *Acer davidii*, and a promising introduction of *Sorbus commixta*.

More recently in botanic gardens and arboreta there has been a move away from planting trees in taxonomic groupings to phytogeographic planting, as in the Himalayan Glade at Wakehurst Place and the Chinese Hillside at the Royal Botanic Garden Edinburgh. Visitors are given an impression of the plant associations and habitats in the wild. In some cases, artefacts in the planting give a sense of place: at Quarryhill Botanic Garden in California, there are prayer flags similar to those in Zheduo Pass, Sichuan; a traditional Japanese house has been erected in the bamboo collection at the Royal Botanic Gardens Kew.

Various kinds of interpretation have been introduced in arboreta to convey information about the collections. At Dawyck Botanic Garden, the *David Douglas Trail* seeks to engage visitors in discovering the tree species he introduced or discovered; the *Wonder at Your Feet* trail at highlights endangered Scottish native plants. Arboreta can be used as outdoor classrooms for people of all ages. A *Dinosaur's Dinner Trail* and a *Children's Tree Day* are held at Wakehurst Place. A meeting of the PlantNet Tree Forum looked at management of swards in Westonbirt Arboretum to encourage displays of orchids and other flowers.

Arboreta are also about spectacle and the 'wow' factor. The avenue of redwoods planted in the 1860s at Benmore Botanic Garden makes a stunning impression in a modern context. The maple glade at Westonbirt is a draw for thousands of visitors for 3 weeks in October every year. Lighting up the 'enchanted forest' in winter brings in another group of visitors to see the trees at a different season.

We need to recognise the unique importance of trees and the value of understanding past development in seeking avenues for future development, to engage visitors in the broad sense.

4 Never work with children or animals

Mark Sparrow, Curator of Horticulture, Chester Zoological Gardens

Many zoos were started as Zoological and Botanical Gardens. London Zoo was opened in 1826. Zoos attract lots of visitors. The image of zoos has changed over the past 250 years, with a modern focus on conservation and research. Purely decorative bedding displays have given way to more naturalistic planting relevant to the habitats in which the animals are found in the wild.

Plants are grown for various reasons in zoos. Chester Zoo has a reserve collection of pleurothallid orchids for the National Council for the Conservation of Plants and Gardens. An orchid festival is held every year. Edinburgh Zoo has a garden of plants of medicinal value to animals. Plants are grown as food for the animals at Jersey Zoo.

The focus on education gives many opportunities for activities about plants as well as the animals. A South American Week for children included a plant day featuring bromeliads, chillies and potatoes. The Jaguar House at Chester Zoo includes an exhibit on smells.

Chester Zoo is almost as famous for its plants as it is for its animals, and has won many prizes for its horticultural displays. Plants are used to create themed gardens and naturalistic habitats for the animals, in addition to traditional ornamental displays. Visitors can enjoy the Roman Garden, Glorious Grasses and Daffodils and the Spirit of the

Jaguar development, featuring a spectacular display of South American plants. New for 2002 is the Grow Zone situated in two large greenhouses, which demonstrates plant diversity and the Zoo's outstanding conservation work.

A trend towards more naturalistic planting in animal enclosures is not without problems. Animals see the plants as food or entertainment! Elephants are very destructive. Their enclosure has been planted with trachycarpus and cordylines. Reed beds have been planted to recycle the water from the elephants' pool. If the planting is too dense, visitors may not see the animals.

The notion of 'public immersion' has been successful in the USA: people are 'immersed' in a habitat or geographic area, created with plants. The 'walk-through' bat house at Chester has proved very popular. Aviaries nowadays include a mixture of birds with a backdrop of plants. The Bronx Zoo has a Congo gorilla forest. The public choose which conservation project their entrance money will support.

5 Plot or prairie?

Dr James Hitchmough, Department of Landscape, University of Sheffield

Studies are being undertaken on the establishment and management of tall-grass prairie plantings in Britain. The purpose is to produce a beautiful effect appreciated by the lay public in terms of vernacular aesthetics, rather than for small cliques. The aim is to do so cheaply, making such plantings suitable for bodies with low funding, such as public parks. The plantings will be as sustainable as possible, requiring low maintenance when established and avoiding the need to transport staff to weed flowerbeds or to use herbicides. The scientific research is resulting in accessible reports and literature that will be of use to future generations. To attain the desired mingling of herbaceous vegetation, scientific studies of ecology, germination and sowing and planting density are crucial as well as studies on the management of hay meadows.

Comparative studies of sowing seed or planting for the desired effect were started at Harlow Carr in the 1990s. Elsewhere, meadows of annuals have been sown to give a dreamy effect with a rich and colourful mixture of species. In northern Britain, meadows with 20 species of Asiatic and European primulas have flourished. Dense swards of tall North American grasses are being studied in Sheffield, using a 'hands off' approach and no watering. At RHS Wisley, a grass prairie of cool-season forbs and C4 grasses such as species of *Panicum*, *Miscanthus*, *Spiroboles* and *Heterolepis* is being established. At latitudes greater than 45°N, C3 grasses, which are compact, are the most successful; at lesser latitudes, C4 grasses are better. So, in Sheffield the grasses were omitted because they were not competitive.

Prairie vegetation – dry, moist or wet – is very diverse. Species with low or medium emergence are easy to establish and so determine the choice of species to be used and the sowing rate: for low-emergence species, more seed is required. This clearly has a cost implication. Establishing a beautiful meadow is not simply a question of 'we plough the fields and scatter the good seed on the land'. The appropriate growing medium is important. Sand is a good medium, with fewer weeds than in topsoil. Trials in charcoal are in progress. Slug predation has the most profound effect on establishment – there appear to be very few at Wisley!

The work is very site-specific, with complex and different interactions among factors at different sites. Current results indicate that plant density in the first year is critical: if a high density of prairie plants is achieved in the first year, the planting is likely to succeed, forming a stable non-invasive plant community. Otherwise intervention is necessary to achieve the desired effect. Prairie forbs can be sown over the top of other planting, especially for early colour.

Experiments are also under way on the effect of burning off or mowing or spraying with a contact herbicide in spring. Prairie vegetation was created by human intervention involving burning.

Trials of the various types of sowing and planting are being carried out at sites in Sheffield, including a suburban back garden, which looked attractive for at least 9 months of the year.

6 New trends in glasshouse planting

Wolfgang Bopp, Middleton National Botanic Garden of Wales

The new glasshouse designed by Norman Foster for the National Botanic Garden of Wales has been planted up to show characteristic plants of six Mediterranean habitats: Western Australia, South Africa, coastal California, Canary Island laurel forest, the coast and foothills of Central Chile, and the Mediterranean flora itself. The interior was laid out to simulate ravines, gullies, rock outcrops, cliff faces and water. It was not acceptable to use limestone from the wild. Sandstone from Germany was used on retaining walls of concrete blocks. Heating is around the perimeter of the glasshouse. The steel structure resulted in drip lines of condensation all through the winter. A planting height was agreed so that the glass structure was always visible, rather than aiming for a 'green jungle' effect. The planting of Mediterranean vegetation is predominantly grey-green.

The paths are constructed of the same gravel as outdoors, but are more compacted. However, as it is not wet every day inside the glasshouse, the dust rises and the gravel becomes looser.

A planting design involving blocks of colour with groups of 20 specimens of each plant had been proposed by the designer, but this was not suitable for a botanical collection.

The glasshouse was opened to the public 3 years after planting, but this was barely long enough to give an established feel to the display. Burnt sticks of gorse from the estate were inserted in places amongst the fire-climax vegetation types to convey a relevant background.

There are terraces above streams in the landscaping, but they are very slippery and so the public cannot be allowed close to them. *Tropaeolum* has been grown over the handrails. *Drosera menziesii*, a very small plant from Western Australia, has been put on display benches. Plants have been put on bricks or plunged in pots. Traditional display methods must fit in with the modern landscaping.

7 Phytogeographically correct! Chilean and Bhutanese collections at Benmore

Peter Baxter, Benmore Botanic Garden

Benmore Botanic Garden, near Dunoon, is one of the four gardens that make up the Royal Botanic Garden Edinburgh. Sixty years ago, those at the Garden were starting to think about plant associations in habitats from images of the wild that they were hoping to reproduce in the Garden.

In 1985/86 after an expedition to study the flora of Bhutan, it was decided to plant the Bhutanese Glade at Benmore, bringing together plants from a habitat and arranging them on site. The Glade ascending 156 m up the hillside at Benmore is based on a walk from the capital city of Thimphu up into the mountains for about 1524 m. There are five zones, based mainly on 12 conifer species: junipers, firs, larches, pines and *Tetracentron sinense*. Planting shows a progression through these zones, with rhododendron, *Betula utilis*, *Sorbus thibetica*, *Abies densa*, and a summit vegetation of juniper scrub. The second phase of planting the Bhutanese Glade took place in 2001, providing a second generation of trees and shrubs as well as herbaceous perennials on the woodland floor.

In 1995, the planting of a Chilean Rainforest Glade was started at Benmore, using 15 acres of the Glen Massan Arboretum. These were cleared to make way for species of with species of *Araucaria*, *Fitzroya*, *Podocarpus*, *Prumnopitys*, *Austrocedrus*, *Pilgerodendron*, *Saxothega* and associated angiosperms. in particular various *Nothofagus* species. The striking Chilean bamboo *Chusquea* is planted here, along with *Desfontainea spinosa* and numerous myrtles. All the plants have been grown from wild-collected material brought back by RBGE members of staff, including those working on the International Conifer Conservation Programme. Planting is not in strict altitudinal zones, as several species are found at different altitudes: *Embothrium*, for example, is found below the *Auracaria* zone, but both at sea level and much higher. It was necessary to establish a canopy and some shelter before some of the species were introduced. There are more than 1450 plants, nearly all from seed of known wild origin. The 110 plants of *Araucaria* are from 19 collections. Some species, such as *Gevuina avellana*, are better

grown at Logan Botanic Garden, further west, as the climate is more suitable.

Work began on creating the Tasmanian Ridge 15 years ago, and the plantings are developing well. Although rare in its native habitat, *Athrotaxis laxifolia* is the most widely planted Tasmanian cedar in cultivation and is represented here, as is *A. selaginoides*. The Tasmanian southern beech (*Nothofagus cunninghamii*) is also planted in this area on the southern slope of the Glen Massan Arboretum. These habitat plantings are in contrast to the other parts of the Garden at Benmore, where plants from different areas are mixed together for visual effect.

8 Restoring order to the family beds

Matthew Jebb, National Botanic Gardens, Glasnevin

What are plant families? In the 1990s, the new science of genetic sequencing opened up a whole new world of understanding. Scientists had been classifying plants for 150 years from their outside appearance, but now, through DNA analysis, plant relations can be considered – quite literally – from the inside. This is not the first major upheaval in plant classification.

In 1736, Carl Linnaeus visited the collection of medicinal plants at Oxford Botanic Garden, overseen by Professor Dillenius. At the age of 29, he had put people's backs up throughout Europe by proposing a revolutionary new system of plant classification based on reproductive characters. He looked at the 'private parts' of flowers – styles and stigmas – a custom his detractors termed botanical pornography! Linnaeus took Dillenius round the Botanic Garden and made him see how artificial the old system was. Dillenius was converted within a few hours and, when it came time for Linnaeus to leave, Dillenius is said to have been in tears. The Garden was dug up and replanted according to the more natural system of Linnaeus.

By the nineteenth century, more natural systems had been proposed, these pre-evolutionary schema reached their zenith in Bentham & Hooker's system. Their *Genera Plantarum* recognised about 7000 genera. It is based on fewer characteristics and is more straightforward –

families can be identified in four or five steps – but it was full of potential mistakes. During its publication, Darwin's *Origin of Species* finally arrived, and this led to many different systems of classification and the notion of primitivism (plants such as magnolias, with petals arranged in spirals, were regarded as more primitive than those with floral parts in whorls).

In 1993, a diagram based on the genetic sequence of a single gene, revealed a most remarkable 95% match with morphological classification. For the first time, an independent analysis allowed morphological characters to be viewed more objectively. Some surprises and solutions to age-old problems were at last available. Buttercups, waterlilies and magnolias were revealed as the progenitors of all flowering plants, and this explained many seeming anomalies. However, DNA is not that tidy and, as more genes are examined, contradictions reveal that the complexities of evolution are not always straightforward.

One of the greatest lessons for any gardener is learning by their mistakes – it is only when we kill a plant that we actually become skilled at our art. In the same way, a knowledge of previous classifications is equally vital. For a start, DNA evidence is useless to us when we look at a plant, and microscopic features such as pollen are equally out of reach. Bentham & Hooker's system may be archaic, but, with a flower in your hand, it is perfectly possible to place it confidently into a family or closely related set of families.

Taxonomy is for human beings – in a sense, all plant families are quite arbitrary, simply being a way to break up the endless continuum of the flowering plant kingdom. The old-fashioned morphological system was designed to be practical and useful. So what of order beds in a modern garden – how should they be arranged? This partly depends on how they are to be used: are they to be a teaching aid, or a display of the historic truth? To my mind the practical morphology is paramount, and the fresh perspective of DNA is the lesson. We should never disregard the past, otherwise we are forced to make the same mistakes. The old-fashioned splendour of Bentham & Hooker's system can be best appreciated by seeing where it is right and where it is wrong. You can learn the practicality of identifying a plant family from the historic layout, and appreciate the hidden insight of our knowledge of DNA only when you see how botanists of the past were misled.

9 The Vegetable Kingdom

Alan Gear, Henry Doubleday Research Association

The Henry Doubleday Research Association (HDRA) has 30 000 members. It promotes the organic production of vegetables in the UK and carries out research on organic horticulture for the Department of the Environment, Food and Rural Affairs. Intensive agriculture resulted in traditional cultivars being replaced by high-yielding ones. The demands of supermarkets and food processors for uniformity in appearance, ease of mechanical harvest and quality when transported also restricted the range of cultivars grown. The outlawing of 'unlisted' varieties through seed registration was now recognised as a mistake. Such seed could not be sold without the risk of incurring a fine. Many varieties that looked the same were in fact distinct: e.g. trials of two onion varieties that looked the same showed that Up to Date was resistant to white rot, but Bedford Champion was susceptible. Some of the old varieties were kept going by individuals, e.g. a crimson-flowered broad bean by a lady of over 90, the pea variety Champion of England from 1843 grows to over 6 feet and has a long cropping period and peas full of flavour. Unlisted seed began to be given away. This situation led to the setting up of the Heritage Seed Library, which now includes more than 800 varieties and has over 10 000 members or 'seed guardians'. The seeds are grown at the HDRA garden at Ryton and more than 200 varieties are made available to members every year.

Concern at the loss of old vegetable cultivars and the need for better facilities led to the development of the Vegetable Kingdom. This is a new seed conservation and visitor centre, where seed can be stored and handled and the public can be informed about vegetables and our heritage of varieties. The new building will be mostly underground and will have a 'green' sedum roof. The centre will enable the Heritage Seed Library to be more proactive in seeking varieties. The bean Brystone was plundered from a wrecked ship off the Isle of Wight. Some varieties, such as those taken to Australia or Canada, may be repatriated. There is so much to tell the public about the history of growing vegetables: how introductions affected social history, the 'Dig for Victory' campaign, biodiversity in the range of cultivars of a single crop. The new centre will include cookery demonstrations, activities and encouragement for children, small plots and demonstration gardens. It

aims to stimulate understanding of the value of the plants in the collection, rather than simply conserving them. The Vegetable Kingdom will open at Ryton in 2003.

10 Heritage vegetables at West Dean

Jim Buckland, West Dean Gardens

The gardens and grounds at West Dean include a nineteenth-century Grade II* listed landscape and a 49-acre arboretum. The emphasis is on striking a balance between preservation and development. The Edward James Foundation is run as an educational institute with a focus on arts, crafts and conservation techniques. The garden is a resource for the college, for recreation and teaching.

The walled kitchen garden was redeveloped in the 1990s and the glasshouses and frames were meticulously retored. It was established at the turn of the last century and covers 2½ acres, with four compartments. It forms part of the overall landscape of the grounds of the college and is now intensively cultivated. Lots of vegetables are grown in the walled garden, but not purely for the traditional reason of providing food for the house. It was decided to develop and enhance the garden within a historic context, with a view to it being economically viable and linking in with the educational remit of the college. The walled garden, run by Sarah Wain, is now a unique feature attracting people to visit the garden.

One quarter is an ornamental fruit garden with a nineteenth-century collection of 100 apple varieties, 50 of pear and 25 of plum. There had been a manicured grass sward under the trees, but this was historically inaccurate and labour intensive. It was decided to grow fruit in as many ways as possible, e.g. trained as goblets or pyramids, to look bountiful and attractive and to inspire and stimulate visitors.

There are 13 glasshouses from 1890–1900, 3 sets of frames used in the 1900s, fruit houses, and display houses of labelled plant collections. The vegetables grown are not only of heritage interest but are also painted, *in situ* and *ex situ*, by those taking art classes at the college. For instance a selection of cabbages is grown for their attractive and aesthetic qualities.

There are quirky collections of cucumbers and celebrated collections of peppers. Aubergines grown at the turn of the nineteenth century for shoot dinners came in all shapes and sizes and are still grown, under glass. The Hot Border in the Kitchen Garden is vivid in summer with scarlet crocosmias, orange dahlias and yellow kniphofias. Growing a range of pumpkins and squashes stretches the season and provides material for the artists studios in winter. In growing heritage vegetables, there is also a link with the Henry Doubleday Research Association.

More than 120 tomato cultivars grown indoors and out, in different colours, shapes and sizes are attractive and easy to use in the kitchen. The *Truly Tomato Show* has become an annual event to celebrate tomatoes. It attracts visitors from far and wide: local organic growers, the Tomato Growers Association, with stalls selling tomato products and tomato tastings. The garden takes part in national Apple Day, with apple displays, tastings, advice and cultivar identification. More than 150 chilli varieties grown in pots make a fantastic display. The *Chilli Fiesta* is a wacky and very successful event, attracting lots of visitors and generating much publicity and interest from TV and other media. There are plants, cards, seeds and foods for sale, making links with cookery and cookery writers. Thus, the fruit and vegetables can be used as a marketing tool, generating excitement and attracting visitors who might not otherwise have come. However, the shows can start to run you, and they need to be seen within the overall context of the gardens.

11 Displays of plant communities at the University of Dundee Botanic Garden

Alasdair Hood, University of Dundee Botanic Garden

The University Botanic Garden at Dundee was set up in the 1970s. From the start, its focus was on science and education. Plants are cultivated in communities to demonstrate adaptations for survival in natural habitats. Within the 9.5 ha of the Botanic Garden, there are examples of oak, ash, birch and pinewood communities; as well as Mediterranean, Asian, American and Australasian habitats, sclerophyllous plants; and temperate, tropical and arid-zone plants under glass.

Native plants are shown in a Scottish hillside habitat, planted to simulate a walk down a glen by a stream on Ben Laws, with tall plants such as birch and pine down the valley, oak lower down with an appropriate understorey, and coastal dunes and a loch. The idea is that local schools and students can relate to areas they know and have visited already. From the outset, the Garden was required to support teaching, and an 'A to Z' layout was avoided. Biodiversity is presented in a logical order, reflecting the 'spirit of nature'. It demonstrates ecosystems, communities and the physical environment, showing plant associations and a range of adaptations. It can be effective for both education and aesthetics.

Planting in this way presents management challenges. The Garden shows the vision of those who planted it in the 1970s, and now has a 'natural' look. However, there has been phenomenal growth in some areas and lots of plants have had to be removed. *Nothofagus procera* has proved very prolific. It is impossible to create exact ecosystems.

Use of the collections has to be encouraged; many could be used for projects by honours students. This is now happening, but it has taken 30 years. Planning is now needed for the next 30 years; some of the communities need to be thinned out. The pine forest is of even-age structure and so regular replanting is necessary. Decisions have to be taken about whether to thin out the beech wood. Some of the native plants are losing their vigour. The glen needs maintenance. All the habitat plantings need to be interpreted for students and other visitors so that they can be fully appreciated.

12 Historical accuracy – or how to go grey in three easy lessons!

David Avery, Brodsworth Hall and Gardens, English Heritage

Brodsworth Hall, near Doncaster, has a 15-acre garden dating from the 1860s, set within an area of eighteenth-century park and woodland and a quarry garden from an earlier house. Brodsworth came into the care of English Heritage in 1990. The Hall is one of the most complete examples of a Victorian country house in Britain. Now, the significance of the garden is beginning to be appreciated.

There was a walled garden – the walls remain but the glass has gone. There are woodland walks with clipped evergreen shrubberies of laurel, box, holly and yew and specimen beeches. By contrast the formal flower garden is very colourful with symmetrical beds cut out of turf, a central Italianate marble fountain and a pair of monkey puzzles. The Grove is an old quarry garden with rocky dells, walkways, bridges and small buildings. The Target Range was originally used for archery practice by the family, and later as a rifle range in the Second World War. Here, is the Target House, probably built from materials from the old hall. A classical summerhouse and statues date from the 1860s. There is a 1920s pump house. The family's dogs and a parrot or two are buried in the Pets' Cemetery, with gravestones dating from 1894 to 1988.

The garden was at its height in 1915, but had been in decline since then and the views originally planned were lost. The yew hedge, not cut since 1916, has now been regenerated – about time! The rose garden has been restored to a collection of old roses. In the flower garden, the beds are all original, but no planting plans or plant lists remain. A 'conserve as found' policy operates in the house, rather than restoration to a pristine condition. In the garden, the aim is to use plants appropriate to the period of the garden, bearing in mind that it was planted for personal pleasure. Visiting by the public is a modern practice here.

The story of the garden needs to be told in relation to the Victorian era, its historic associations and where the plants came from. Most visitors come for visual pleasure, but more are asking questions. Correct planting of mainly nineteenth-century varieties of bedding plants and bulbs will be used if they can be sourced, but with change and experiment, as this would have occurred at the time, trying out new plants and fashions. In a spring display, *Tulipa turkestanica* has been used as bedding and *T. saxatilis* as the edging for herbaceous borders. In the Flower Garden the rainbow bedding is in the original style, but the next stage will be to find and use more of the original cultivars. The rock garden was not intended to be naturalistic, but to provide pockets to display particular plants. It has now been planted with a collection of 250 hardy ferns, including *Asplenium scolopendrium* 'David Avery'. The site is sheltered and should be suitable for tree ferns.

All these features need to be explained to visitors, striking a balance between education and entertainment. There are many ways to interest children in the plants. The Victorian era is part of the national curriculum. *Camassia* is a food source for some Indian tribes, *Eremurus* dazzles people because it is unexpected, *Arbutus* fruits are a laxative, *Ruscus* has a leaf growing out of a leaf.

The lawns were left for many years without close cutting or the use of herbicides. There is now a rich wild flora, with cowslips, rest harrow and orchids, one of the few remaining areas of natural magnesian limestone grassland. These areas need to be managed appropriately; stumps and habitat piles are left for insects, fungi and other wildlife.

13 Terror firma– creating a garden with bedrock . . .

Simon Goodenough, Ventnor Botanic Garden

Ventnor Botanic Garden on the Isle of Wight covers 22 acres and is on solid rock. It is the nearest to a Mediterranean climate in the British Isles, having more sun than Cornwall.

From solid rock to a feature garden! Rock with lower greensand was to be converted to a Mediterranean scree, bringing in a JCB and heavy machinery to create a chasm and smashing the extracted rock to form the scree. But would it be possible to grow anything in it? We could have thrown seed into a big hole – but 300 *Dracunculus vulgaris* would have been very smelly.

Now, the garden features tulips and other plants baked in the rocks and setting seed. The aim is to show the diversity of such vegetation. A community is developing and plants are seeding in. A band of chert, which is very sharp when smashed, provides a good habitat for naturalising gladioli and asphodels. A created ruin and well are good sites for naturalising verbascums, thymes and lavenders. There are paths through the planting, so that people are encouraged to be amongst the plants and intimately involved with them rather than viewing from afar. *Echium pininiana* has become an invasive weed in the garden, forming one of the largest stands in the British Isles.

14 Collection planning with the Rosemoor masterplan

Christopher Bailes, Royal Horticultural Society Garden Rosemoor

Lady Anne Berry moved to Rosemoor in 1931. She travelled widely and built up a collection of 4000 plants in her garden, which she presented to the RHS in 1988. The bequest comprised 8 acres around the house and a further 32 acres of pastureland. The present garden, created over just a few years, is connected to the mature planting of Lady Anne's garden by a winding rock gorge, planted with ferns and bamboos.

A masterplan for the garden was drawn up for the RHS by Elizabeth Banks Associates. The aim is to inspire, educate and entertain. The brief was to grow the widest range of plants in the West Country, and to demonstrate a wide range of gardening skills through demonstration gardens. Regional RHS gardens are intended to be diverse, and not to be clones of Wisley. Design went with the field pattern, large oaks have been retained in field boundaries. A backdrop of mature trees outside the boundary acts as a buffer zone between the garden and commercial forestry plantations. This provides a setting and extends the garden so that it sits within the landscape.

The new garden area at Rosemoor is still in the early stages of development. In the first 10 years, the emphasis has been upon intensive and highly ornamental gardens, with roses, shrubs, perennials and bulbs, stream and bog plants and produce of all kinds in a fruit and vegetable garden and a potager. A few myths have been punctured and new ideas introduced. There were said to be 'no rose gardens in the West Country', but the one at Rosemoor has proved successful. The formal garden, of interest from June to October, extends the range of plants to include grasses and foliage features and herbaceous borders that are not characteristic of West Country gardens. The gully garden combines naturalistic planting, intermingling with subtropicals. Natural effects have been enhanced to make the most of spectacular displays, e.g. primrose banks, lady's smock and wild orchids. Continuity of planting is part of a 5-year development plan.

15 Discussion and summing-up

Simon Thornton-Wood, PlantNet Chairman

The conference had been a voyage of discovery, from ‘wow’ factors and features to bring in visitors to historic and environmental authenticity in restoration and planting. It is not always possible to predict what impression people will take away from a visit to a garden – take-home messages are personal and individual.

The range of expertise in traditional and modern techniques and styles of planting and display was impressive. We do it because we enjoy it, indulging our passion for plants. We invite people to come and see the diversity in our gardens and to share our enthusiasm with them.

Thanks were expressed for an informative, instructive and enjoyable conference and to all those who had made it such a success.

Garden Visits

16 Pre-conference tour

Trebah was first laid out in 1826 as a 26-acre pleasure garden by Charles Fox, a Quaker polymath, who imported seeds and plants from all over the world and paid meticulous attention to the exact positioning of every sapling. The Hibbert family began to restore the garden in the 1980s and it is now run by the Trebah Garden Trust and open to the public. This subtropical paradise is home to a unique collection of rare and exotic trees and shrubs, winding 200 feet down to a private and secluded beach on the Helford River. A stream cascades down the wild ravine, through pools and a water garden, through glades of tree ferns and palms, and beneath a canopy of 100-year-old rhododendrons and magnolias to an extensive stand of *Gunnera manicata* in the valley and 2 acres of blue and white hydrangeas. We were shown around by Malcolm McLachlan, Head Gardener.

www.trebah-garden.co.uk

Heligan, near Mevagissey, was the largest garden restoration in Europe. The Lost Gardens of Heligan (pronounced 'ligan) extend to some 80 acres of pleasure grounds together with a complex of walled gardens, including an oval walled garden with melon frames and a pineapple pit, and a productive vegetable garden. It was at its zenith at the end of the nineteenth century and is a monument to three generations of the Tremayne family. There is an Italian Garden, a Fern Ravine and a Crystal Grotto whose interior was lit by candles for romantic summer evenings. The Jungle is a sheltered valley with four linked ponds and a board walk through subtropical exotics, an amazing site with palm trees, tree ferns and huge flowering rhododendrons framed by the emerging foliage of the oak trees on the far horizon. In the Lost Valley a Georgian ride has been restored through a tract of Cornish woodland. On Flora's Green, surrounded by rhododendrons brought back from the Himalayas by Sir Joseph Hooker in 1847–849, Peter Stafford gave us an introduction to the history and restoration of the gardens.

www.??????

Tregothnan, situated at the head of the Fal Estuary, near Truro, has been the home of the Boscawen family since 1300. With collections of rare and endangered conifers, original introductions brought back from by plant hunters such as William and Robert Lobb and plants from expeditions to China and South America, the garden covers approximately 50 acres, but is not open to the public on a regular basis. Jonathon Jones, Head Gardener, gave us a guided tour. More than 100 years ago, Evelyn Boscawen and Rev John Townshend Boscawen introduced rhododendrons, rare trees and the earliest outdoor plantings of camellias in the country. There is an avenue of century-old myrtles and another of tree ferns, a huge cork oak and a specimen of *Trachycarpus fortunei* reputed to be the tallest in the country. The challenge now is to provide colour throughout the summer using southern-hemisphere plants. A grove of monkey puzzles has been planted to give the feel of the trees' natural habitat. Tea plants are being cultivated in the walled garden. Tregothnan Foliage specialises in growing more than 100 kinds of foliage on the estate for despatch to florists.

www.tregothnan.com

Trewithen, at Grampond, Truro, dating from 1715, is one of the outstanding west-country houses of the eighteenth century. The gardens, covering some 30 acres, are famous for camellias, rhododendrons, magnolias and many rare trees and shrubs. The camellia Donation and various rhododendron cultivars originated at Trewithen. The woodland gardens, surrounded by landscaped parkland, were extended by George Johnstone in the first 50 years of the twentieth century. In 1905, a year after he inherited Trewithen, 100 hybrids of *Rhododendron arboreum* arrived for planting. The felling of 300 beech trees for use as trench props by troops in the First World War led to his development of a great glade stretching out from the front the house. This was planted to be viewed from the house, and today provides a spectacular and colourful vista in spring. Alistair Rivers gave an introductory talk on the history of the gardens.

www.trewithengardens.co.uk

The Eden Project, near St.Austell, was built in the natural amphitheatre formed by an old china-clay pit. The highlight of the 34-

acre site is a series of gigantic geodesic biomes that form the largest greenhouses (not of glass, but of plastic film) in the world. The rising slopes of the old quarry are planted with crescent-shaped blocks of useful and vital plants, from dyes and fibres to foods and beverages, many of them associated with Cornish industries. The typical grey-green foliage of florals of the Mediterranean, California and South Africa gives the Warm Temperate Biome a completely different feel from the dense, lush, tropical planting in the Humid Tropics Biome. Various novel displays of art and artefacts are encountered along the way, as aids to interpretation. The outdoor landscape has a range of exhibits about how we use plants. The nursery backing up the displays is also of great interest.

www.edenproject.com

Pine Lodge Gardens, Cuddra, St. Austell, is a private garden of 30 acres, planted and run by Raymond and Shirley Clemo since 1976. It has many rare shrubs and flowers as well as water features, ponds, statues and an arboretum. A 4-acre pinetum, started in 1993, has 80 conifers planted as an amphitheatre, with the largest on the perimeter. The Skakkei garden features plants grown from seed from Japan. The fully catalogued collection in the gardens stands at over 6000 plants, many grown from seed from plant-hunting expeditions.

www.pine-lodge.co.uk

17 Visits during the conference

RHS Garden Rosemoor, Great Torrington, North Devon, was given to the Royal Horticultural Society in 1988 by Lady Anne Berry. The original garden of 8 acres, tucked into the north-east corner of the estate, is very much a plantsman's garden. Dominated by the surrounding woodlands, it contains a number of discrete areas where choice subjects take full advantage of the warmth and shelter offered by the south-westerly aspect and high ground to the north. The new garden areas complement and contrast with Lady Anne's garden, featuring a great diversity of garden styles, with something of interest for all gardeners throughout the year. The estate is made up of numerous individual gardens, inter-linked in a design to form one big garden. The present garden is connected to the mature

planting of Lady Anne's garden by a winding rock gorge, planted with ferns and bamboos. A stream running from the gorge and the bog garden leads to a lake. There is a formal garden and a rose garden; potager, herb, fruit and vegetable gardens; foliage and plantsman's gardens; winter, dry and model gardens; as well as an arboretum and NCCPG national collections of dogwoods and hollies. We were shown around by Chris Bailes, Sara Chesters and other staff.

www.rhs.org.uk

Marwood Hill, near Barnstaple, is a 20-acre garden started in 1950 by the late Dr J A Smart. It has three lakes, a stream with waterside planting and a bog garden. The gardens hold national collections of *Astilbe*, *Iris ensata*, and *Tulbaghia* for the National Council for the Conservation of Plants and Gardens, as well as magnolias and a large collection of camellias outdoors and in a greenhouse. Many rhododendrons have been planted, and cherries are in flower by Easter, followed by primulas, astilbes, irises and other herbaceous plants. There is a wisteria pergola and a collection of clematis as well as a rockery and alpine scree. We were shown around by Malcolm Pharoah, Head Gardener.

www.????

Knightshayes Court is a striking gothic house began in 1859 and now owned and run by the National Trust. It was built for John Heathcoat-Amory by the architect William Burges, and finished by J.D. Crace. The garden, laid out by Edward Kemp in the 1870s, is one of the finest in Devon. It consists of a series of terraces and woodland gardens and glades, known for glorious displays of spring-flowering trees and shrubs. Michael Hickson, Head Gardener at Knightshayes for many years, gave us a guided tour.

www.nationaltrust.org.uk

Indexes

Index of gardens

Abbotsbury Sub-tropical Gardens
Audley End
Bedgebury Pinetum
Benmore Botanic Garden
Bicton Park Botanical Gardens
Biddulph Grange
Birmingham Botanical Gardens
Brodsworth Hall Gardens
Cambridge University Botanic Garden
Chester Zoological Gardens
Cragside
Dawyck Botanic Garden
Down House
Dunham Massey
Eden Project
Eltham Palace
Fyvie Castle
Glasgow Botanic Gardens
Glasnevin, National Botanic Gardens
Greenway
Heligan
Kilmacurragh
Knights Hayes Court
Logan Botanic Garden
Marwood Hill
Middleton, National Botanic Garden of Wales
Osborne House
Pine Lodge Gardens
RHS Garden Hyde Hall
RHS Garden Rosemoor
RHS Garden Wisley
Royal Botanic Garden Edinburgh
Royal Botanic Gardens Kew

Sheffield Botanical Gardens
Sheffield Park
Sir Harold Hillier Gardens & Arboretum
Trebah
Treborth Botanic Garden
Tregothnan Botanic Garden
Trewithen
University of Birmingham Botanic Garden
University of Dundee Botanic Garden
University of Oxford Botanic Garden
Ventnor Botanic Garden
Waddesdon Manor
Wakehurst Place
West Dean Gardens
Westonbirt Arboretum

Index of topics

Authenticity
Avenue
Bedding
Conservation of plants
Cultivars
Ecological planting
Education
Ferns
Geographic plantings
Glasshouses
Grasses
Habitat planting
Interpretation
Kitchen gardens
Lawns
Lichens
Lower plants
Mazes
Meadows
Mosses
Natural planting

Order beds
Potager
Research
Restoration
Rock gardens
Swards
Trees
Visitors
Walled gardens



PlantNet is the national network of botanic gardens, arboreta and other documented plant collections

- promoting botanical collections in Britain and Ireland as a national resource for research, conservation and education
- facilitating networking and training among holders of plant collections through a programme of conferences and workshops and a regular newsletter.

Details from:

*Judith Cheney, PlantNet Administrator
c/o University Computing Service, New Museums Site
Pembroke Street, Cambridge CB2 3QH
Tel & fax 01223 763901, jc151@cam.ac.uk*

www.plantnet.org

PlantNet: The Plant Collections Network of Britain and Ireland is a company limited by guarantee registered in England 3777793; registered charity 1081747.

