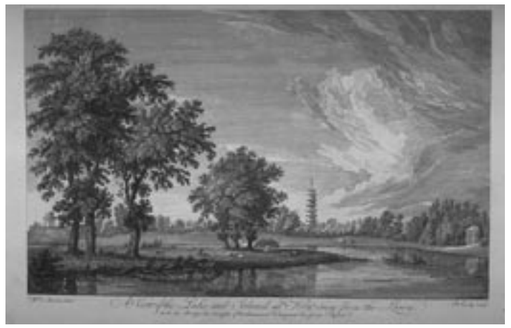
UNITED KINGDOM
ROYAL BOTANIC GARDENS, KEW

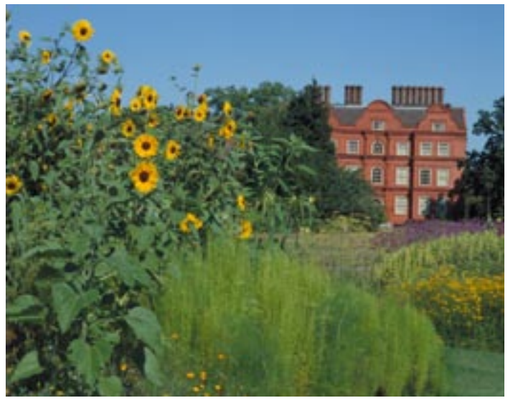
One of the most famous botanical gardens in the world, the Royal Botanical Gardens at Kew is a venerable, much loved and internationally respected institution. Indeed, it was recently awarded UNESCO World Heritage Site status and today attracts over a million visitors every year. Spanning 300 acres of landscaped gardens, and deriving from over 250 years of horticultural heritage, the site hosts over 40 historic listed buildings, as well as several other structures and visitor attractions. However, the numerous structures pale in comparison to the vast collection of plants, trees and fungi nurtured at Kew; the park lists nearly 29,000 taxa and nearly 110,000 living plants. These phenomenal figures begin to communicate the unparalleled biodiversity on display.

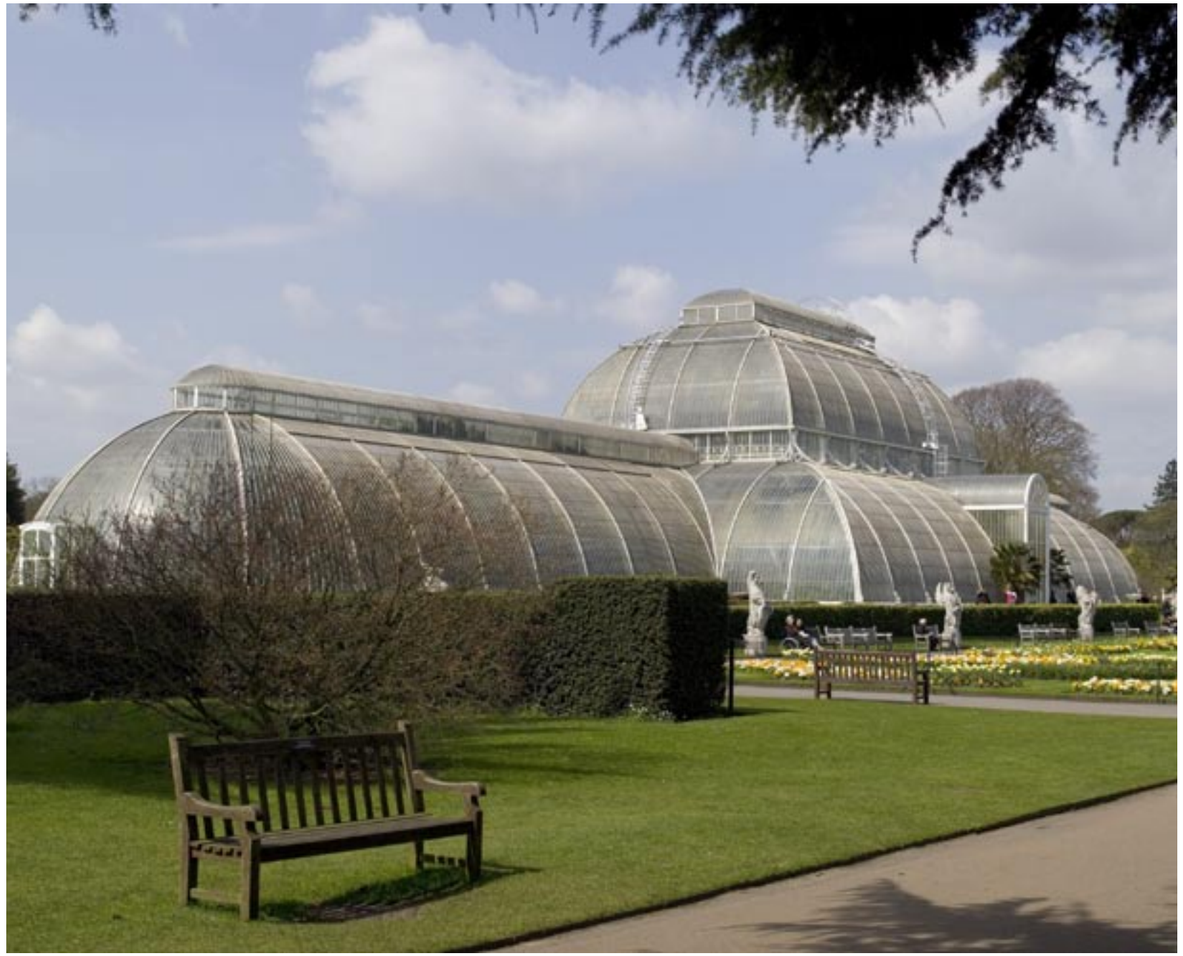


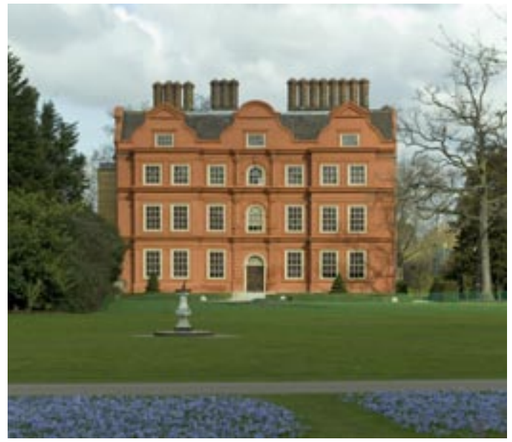
It can be reasonably concluded that the origins of the current gardens date back to mid 1600s. The site passed through phases of settlement and agriculture, until the estate was cultivated by the Capel family, who happened to share a particular passion for horticulture. Through the next two hundred years, the site of Kew Park, or Kew Field, as it was variously known, passed through phases of feudal, political and monarchic tumult, gaining additions and structural embellishments throughout. One example of the parks architectural morphology is the Dutch House, now known as Kew Palace, which is the oldest structure within the grounds today. Originally built in 1631 by a Flemish merchant, with its distinctive brickwork and rounded gables strongly reminiscent of the builder's homeland, it was subsequently purchased by King George III as a nursery for the younger royals. The surrounding locality, which included the Richmond riverbank, evolved elegantly, turning Kew into a haven of pleasure gardens; temporary follies were often erected in various architectural styles for the amusement of the noblesse of the eighteenth century. These were often a reflection of the Empire's broadening interest and forays into the wider world; for an example of this enthusiasm one need look no further than the surviving and restored Grand Pagoda, erected in 1762. The structure rises to fifty feet at its peak and is tiered into ten octagonal levels; however, despite its exotic elegance amongst the verdure, it has lived through an altogether more sinister history as a test site for examining the way bombs were to be dropped during the Second World War.

The pagoda opens to the public for the first time in 2007, allowing visitors to view an unparalleled 360 degree panorama not only of the beautifully tended gardens but also, spectacularly, the city of London stretching beyond.

In 1840 Kew was adopted as a national botanical garden, and enlarged substantially. Several of the subsequent structures are





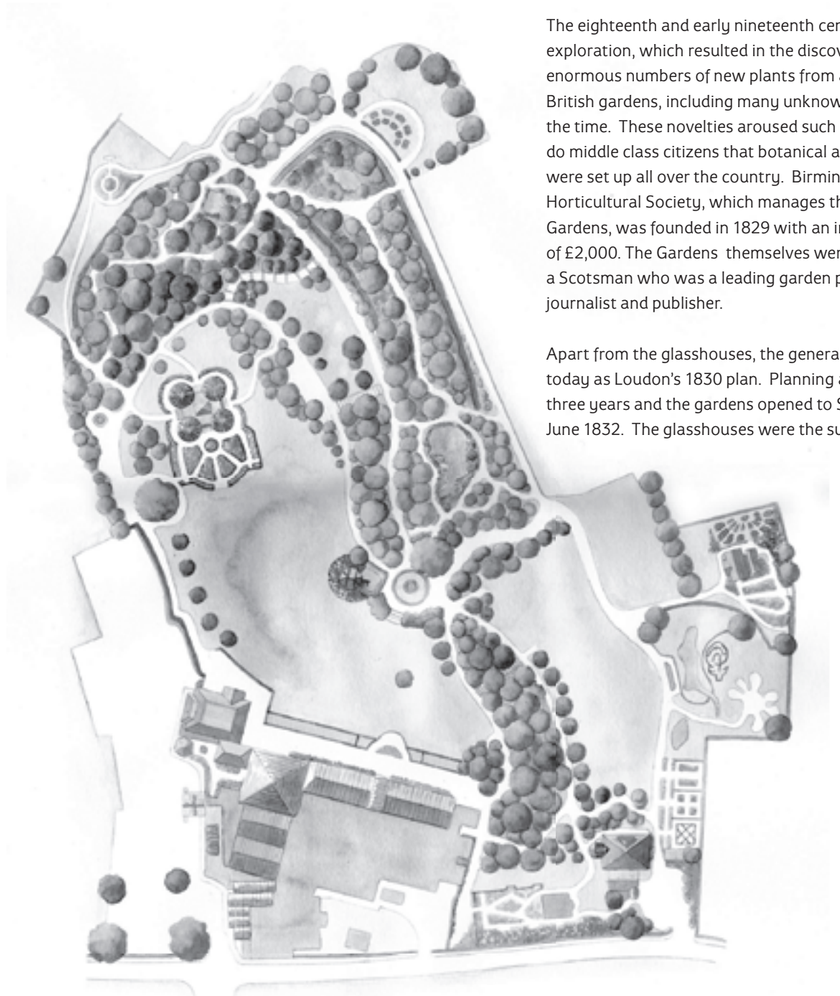


noteworthy in their innovative, pioneering endeavours towards housing the garden's extensive range of plants, as well as their mere aesthetic function; often, building technology advances were essayed in their very early stages to create them. For example, the Palm House, erected in 1848 by architect Decimus Burton, features the first large-scale structural use of wrought iron. The Temperate house, which is twice as large, followed later in the 19th century and is now the largest Victorian glasshouse in existence, though it is surpassed in size by the modern and unique Princess of Wales Glasshouse, so large it nurtures no fewer than ten microclimates. The gardens boast numerous glasshouses, including those devoted specifically to Alpines, Bonsais, Water lilies and Palms. The Orangery is another of the gardens' elegant historic buildings, stuccoed and classically proportioned, and which originally boasted what must have been one of the earliest underfloor heating systems in horticultural use. In 1769 Sir John Parnell proclaimed it 'filled completely, chiefly with oranges which bear exceptionally well and large'. These days, however, it houses a deservedly popular café and restaurant - an ideal spot to take respite from the wealth of mental and sensory stimulation at Kew. In contrast, the sculptural White Peaks is a striking modern building, which features an exhibition space housing ever-changing displays of contemporary art.

The botanical displays are too numerous to summarise individually; amongst the outdoor ornamental exhibits, notable are the divinely fragrant Lilac Garden, which features in the old music hall number "Come down to Kew in Lilac Time", and the stunning panoramic Colour Spectrum garden. The Secluded Garden is designed for sensory enjoyment, featuring a rippling water feature, and an array of rustling, fragrant planting. The Climbers and Creeper section is one of the most recent outdoor exhibits and is uniquely one of the most interactive displays in the park, encouraging young children to physically engage and play with the plants displayed. The interaction between people and plants is one that is celebrated in splendour all over Kew, familiarising and enjoying close contact with plants, and fostering a respect in younger generations is increasingly important today, as is reflected in such participatory exhibits and programmes.

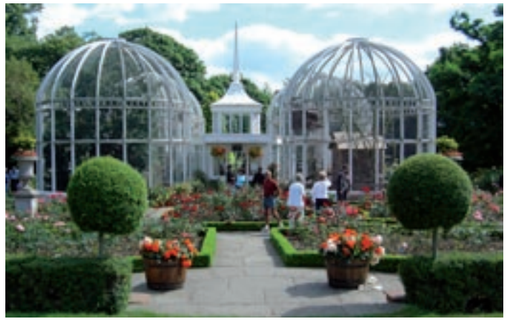
Aside from providing pleasure through its dozens of naturalistically landscaped areas, informative and ornamental displays and history-steeped architecture, the Royal Botanical Gardens at Kew is a peerless and world famous scientific organisation. Once referred to as the 'international metropolis of plants', it is i respected worldwide for its outstanding living collection; it is also renowned for its world-class herbarium as well as its scientific expertise and authority in plant diversity, conservation and sustainable development in the UK and around the world. It is impossible to take in all of Kew's 300 acres and many attractions at once. The fascinating past of the gardens is embedded in its buildings and collection, but the ever-developing present continues to delight and surprise. Truly a national treasure, the Royal Botanical Gardens at Kew are now a world destination, and in an increasingly urbanised future they will surely continue to be an invaluable and cherished institution.

UNITED KINGDOM
BIRMINGHAM BOTANIC GARDENS



The eighteenth and early nineteenth centuries were times of global exploration, which resulted in the discovery and introduction of enormous numbers of new plants from all over the world into British gardens, including many unknown even to botanists at the time. These novelties aroused such interest among well-to-do middle class citizens that botanical and horticultural societies were set up all over the country. Birmingham Botanical and Horticultural Society, which manages the Birmingham Botanical Gardens, was founded in 1829 with an initial subscription capital of £2,000. The Gardens themselves were designed by J. C. Loudon, a Scotsman who was a leading garden planner, horticultural journalist and publisher.

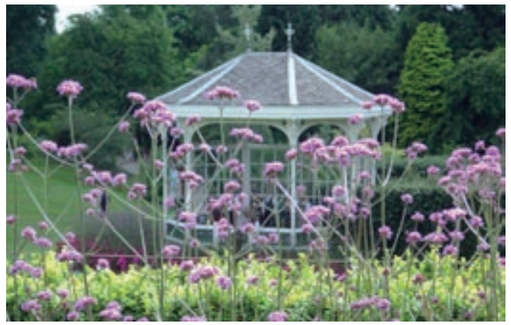
Apart from the glasshouses, the general layout is much the same today as Loudon's 1830 plan. Planning and construction took three years and the gardens opened to Society members on 11 June 1832. The glasshouses were the subject of discord between the Society and the designer, whose plans for a very large circular house were rejected on financial grounds and replaced by a simpler suite constructed by a local firm.



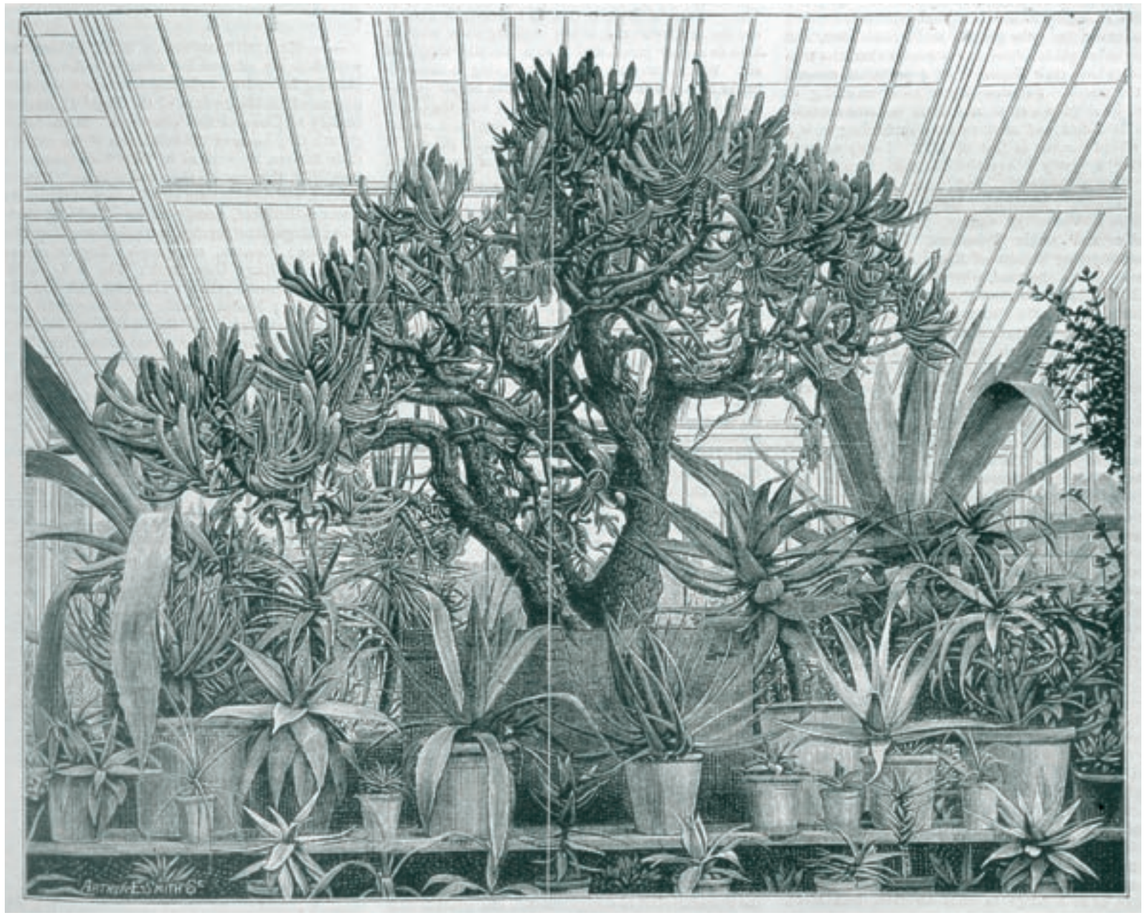
The glasshouses have always been a major attraction: the Tropical House was built in 1852 to house the famous tropical water lily, Victoria amazonica; the Palm House, now the Subtropical House, in 1871 and the present range of Terrace Glasshouses were added in 1873. The Tropical House was rebuilt during 1990/91 and the other houses improved and replanted during the major redevelopments carried out between 1986 and 1987. In an effort to increase the membership of the Society, a zoological collection was started in 1910, well before any such enterprise elsewhere in the region. The list of animals to be seen in succeeding years included monkeys, seals, alligators, pythons and wallabies, but the best remembered are the three bears, one of which, 'Gladly —the cross-eyed bear' was named in parody of a hymn. The most recent addition of zoological interest is an Aviary constructed in 1995, housing a varied collection of birds in four separate flights.

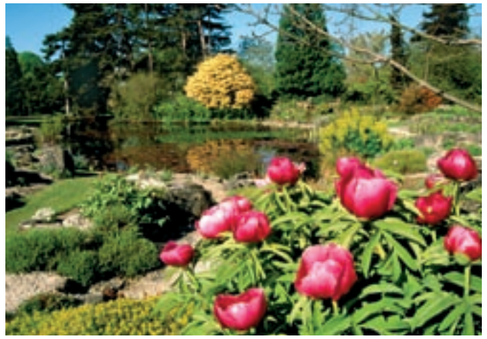
The gardens offer a mosaic of grounds in contrasting styles to appeal to the varied interests of members and visitors. For some, a restful atmosphere is the most important aspect of the area, therefore some areas are laid out and planted mainly for relaxation and recreation, for adults and children alike. One small plot devoted to British native plants recreates an old flower-rich hay meadow, once common under a more sympathetic type of agriculture, but now almost vanished. Other units have been modelled as illustrations of the craft of horticulture through the ages.

For plantsmen, the attraction of growing plants lies in their immense variety and their individual personae as objects of interest and curiosity, but especially in the way they relate to environments in their native lands. Glasshouses and parts of the Gardens have, therefore, been devoted, as far as resources permit, to collections representing the plants of various geographical regions and to plants which mankind has favoured for food. One of the main objectives of the founders of the botanical gardens was to encourage the study of the plants discovered as a result of commercial exploration of the world beginning in the sixteenth century, to which objective has now been added the conservation of species threatened by exploitation. To this end, an education programme has been developed over the years, a programme which has proved increasingly popular with schools and which, it is hoped, will help to disseminate information about plants and promote an attitude of respect for the world's vegetable resources. Appropriately for a botanic garden, pathways have been dedicated to the memory of explorers, planners and authors who have made outstanding contributions to the culture of plants for gardens.



UNITED KINGDOM
CAMBRIDGE UNIVERSITY BOTANIC GARDEN





The valued relationship between science and any botanical garden—whether affiliated with a university or scholastic centre or not—is unwavering. Almost all botanical gardens borrow from the hugely influential model of northern Italy universities, including Padua, Pisa and Florence, which fostered the links between growing plants and immersed, academic study. This relationship is still fundamental to the function of any and every major botanical garden. Very few gardens, however, trace the history of how this academic study was conducted and how botany itself has developed as a scientific practise. In that sense, the Cambridge University Botanic Garden is unique.

The Cambridge University Botanic Garden is divided in to roughly two areas: the older section to the west, established by John Stevens Henslow in 1846, and the newer section incorporated in to the site in the 1950s using a legacy left to the University by alumnus Reginald Cory. This older section, particularly the Victorian Garden, was created with the main purpose of providing a beautiful landscape. Victorian botany was deeply engaged with the discovery and study of new species, sailed back to Britain from all corners of the Old and New Worlds as the Empire spread and spread in to new territories. It was the systematising, classifying and compartmentalising of nature. Hence, during this period, botanic gardens represented science's new ability to temper and master Mother Nature; also to create emblematic and awe inspiring landscapes celebrating the curators' horticultural skill. This is probably most apparent in the Systematic Beds, in which a wide range of species are cultivated according to their taxonomic group. This Victorian section at Cambridge is not so much an ode to nature, as an ode to botany itself.

Moving on to the newer, mid-twentieth century gardens, one is immediately aware of a shift in botanical practice. The plants here are arranged thematically, and hint at the new scientific developments in botany that give a thorough overview in to the interaction between classified species. The curators are keen to identify how this new part of the garden 'celebrates our understanding of interactions between different species'. The Autumn Garden, Scented Garden, and Dry Garden are the highlights. The latter features predominantly Mediterannean plants (though there are some British natives too) that require absolutely no watering. There is also the fairly small Chronological Bed, which contains plants from around the globe arranged in to a timeline based on their introduction into Britain. Starting in Roman times, and ending in the 1700s, this section also covertly tracks the trajectory of British colonial relationships.

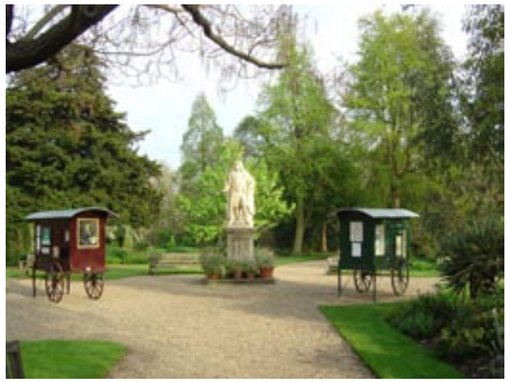
Cambridge University Botanic Garden is not merely historical evidence of botanical study, it is also a very important academic centre for the geneticists, plant scientists, zoologists, and geographers at the University. The Garden contains a whole series of structures built for the express purpose of scientific research, including laboratories, glasshouses and growth rooms. The design of the landscape has also come under scrutiny in the past by architecture students. One foot in the past, one in the future, the garden's prominent authority in the field of scientific research and development remains superior.

UNITED KINGDOM
CHELSEA PHYSICS GARDEN

When it comes to horticulture and Chelsea, it is probably the annual Flower Show that immediately springs to mind. The Chelsea Physic Garden is its elder and quieter sister, but nonetheless just as worthy of the limelight.

Back in 1673, when the garden was first established, Chelsea was chosen because of its location next to the Thames. The river provided a slightly warmer climate, and meant that a wide variety of non-native plants could be cultivated:
an idea that had always been central to Chelsea's ethos. London was also an international capital of trading in the seventeenth century, and the garden's location close to the river enabled the transportation of plants coming in from overseas.

It was London's relationship with many colonial centres that contributed so greatly to the collections at Chelsea Physic Garden. Chelsea's collection of native Chinese specimens is perhaps one of the most extensive in the world, and stretches well back to the nineteenth century. There are the two female Maidenhair trees



(*Gingko biloba*) next to the entrance—species that have great resonance in Chinese culture, where they represent long life—as well as the *Ehretia dicksonii* whose yellow berries border the main lawn. These plants are very rare elsewhere in the UK, and were introduced to Chelsea in 1897 by Ernest Wilson. Perhaps the most important though—this is Britain, after all—are the tea plants (*Camellia sinensis*) that were brought here in 1848 by Robert Fortune. They still signify the part Chelsea Physic Garden played in the establishment of the tea industry in India, that stems back to the original plantations in China.

Although older than nearby Kew Gardens, Chelsea only opened to the public (and still only on a limited basis) in 1983. It is possible however for the public to catch up on what they missed during Chelsea's 400 year lifespan. The garden displays its own heritage in a garden solely devoted to the plants named after botanists or traders linked to its past. There is also the proud statue of Dr. Hans Sloane, stood in the very centre of the garden. He of Square and Street fame leased the four-acre site to the Society of Apothecaries in the eighteenth century, after which the garden firmly developed its reputation.

One of the most intriguing exhibits at Chelsea is the Rock Garden. It is probably the only instance in any botanic garden where the rocks supersede the actual flowers growing around them in terms of importance. Completed in 1773, and recently restored, the garden is constructed of antique stones from the Tower of London, as well as Icelandic lava.

On the subject of lava, there is also a set of *Echium wildpretii* growing here—the plant more commonly to be found growing atop the Mount Teide volcano in Tenerife. Its tall spikes of crimson flowers are incredibly rare, and have to be covered with a fleece during the winter months, as it gets rather resentful at the cold.

UNITED KINGDOM
EDEN PROJECT

Architecturally, horticulturally, socially: The Eden Project is spectacular on all counts. Perhaps the only major botanical institution to be established in the twenty-first century, it has already become one of the most significant and most flamboyant botanical gardens in the world.

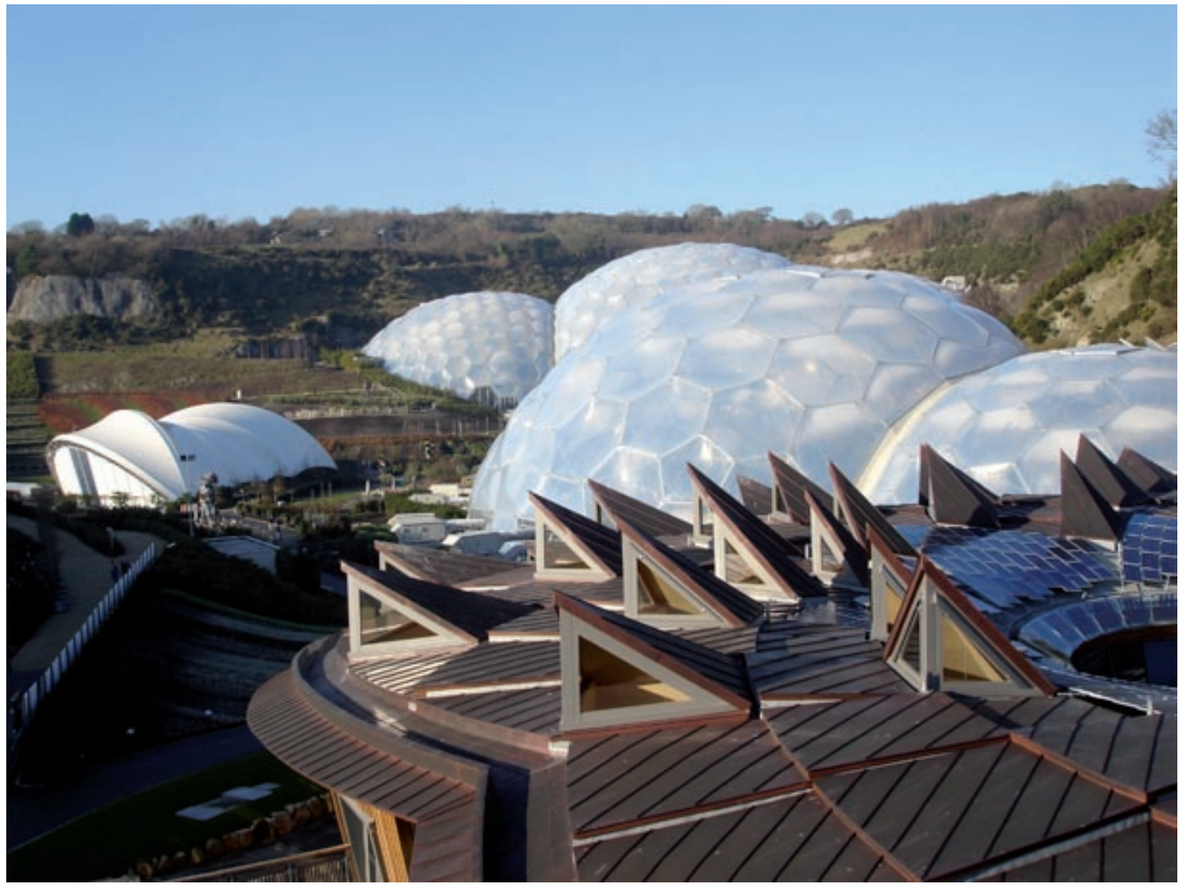
The Eden Project was conceived first and foremost as a site where the public could reconnect with its local and global environment. It highly values the bonds between plants, people and places, and this municipal concern is played out under the curvaceous, amoebic glass domes of the site in Cornwall, one of Britain's most beautiful and most historical territories.

The Eden Project was the brainchild of Tim Smit, a Netherlands-born British businessman. West Country horticulture owes a lot to this man: Smit was also responsible for the extensive redevelopment and regeneration of the Lost Gardens of Heligan, near Mevagissey in Cornwall. In some ways, Eden is just as much an architectural venture as a horticultural one, and Smit worked closely with architect Nicholas Grimshaw (now Sir Nicholas) to bring the Eden idea to physical reality. Grimshaw's primary vision for the site was the inclusion of the two transparent domes, and he based their iconic design on the undulating shape of the biome houseplant. He was also responsible for designing what is known as The Core, a late addition to the Eden site and home to the educational resource centre. Grimshaw developed the geometrical design of The Core's roof in collaboration with sculptor Peter Randall-Page and Mike Purvis of structural engineers SKM Anthony Hunts. The design was based on the Phyllotaxis, the mathematical basis for nearly all plant growth; the 'opposing spirals' found in many plants such as the seeds in a sunflower's head, pinecones and pineapples. Throughout Eden's formation, a cross-fertilization of architecture, ecology and botany is apparent.

The two 'biomes' house the two halves of Eden's botanical

collection. The larger, the Humid Tropics Biome, is for tropical plants such as fruiting banana trees, coffee, rubber and giant bamboo, and is kept at a tropical temperature. The smaller of the two, the Warm Temperate Biome, houses familiar warm temperate and arid plants such as olives and grape vines. In both cases, the architecture is just as intriguing as the plant life. The biomes are constructed from a tubular steel frame with mostly hexagonal transparent panels made from a complex plastic knows as ETFE (the sheer weight of glass meant it was essentially out of the question for this structure). The structure is completely self-supporting, with no internal supports, and takes the form of a geodesic structure: The influence of the glass Climatron building at the Missouri Botanical Gardens, built in 1960, should not be underestimated. The plastic panes vary in size up to nine metres wide, with the largest at the top of the structure.

The use of plastic in the architectural design signals the Eden's Project central concern: that of the environment. Throughout the gardens, there are attractions and information signs on Global Warming, and why plants are so important to our way of life (there is one animation display, showing what our world would be like without plant life). The massive amounts of water required



to create the humid conditions of the Tropical Biome come from sanitized rainwater, and they use Green Tariff Electricity, generated by one of the many wind turbines in Cornwall. It is also home to the Eden Trust, a registered charity devoted to the promotion of the vital relationship between plants and people, leading towards a sustainable future for all. The garden is passionately concerned with the advancement of renewable energy, biodegradable waste and effluent control systems.

The Eden Project is unique in that it raises the question of what concerns a contemporary botanical garden should have, whether they be entertainment, education or ecology. At its very heart, the Eden Project shows a desire to return to nature just as much as other botanical gardens can sometimes remove. Built with the luxuries of modernity, the Eden Project has forged a new ecological role for botanical gardens and, since its opening in 2001, has seen many international gardens follow suit.