University Botanic Garden

Annual Report 2010-2011

CAMBRIDGE UNIVERSITY *Botanic Garden*

UNIVERSITY OF CAMBRIDGE

Director's Report

This year has been one of the most significant in the Garden's recent history. On 31 December 2010 the Director, Professor John Parker, retired from his post after 14 years and I write in my role as Acting Director while the recruitment of a successor is underway. John Parker, who was appointed after a major review of the Garden, leaves a vibrant place that has seen unprecedented growth in visitors, becoming an ever more important place for the University and people of Cambridge and the region. His achievements are too numerous to list here, but perhaps some of the most significant have been the establishment of the diverse and highly popular education and outreach programme and his research into the Garden's founder, Professor John Steven's Henslow, which established how Henslow laid the foundations of evolutionary thinking and explored the influence of this on his most famous pupil, Charles Darwin. Henslow's ideas are embedded in the heritage tree plantings in the Garden and his herbarium collections. One of John Parker's lasting achievements was to oversee the building of the Sainsbury Laboratory Cambridge University on behalf of the Garden, an institute devoted to furthering the understanding of plant evolution and development.

The handover of the Sainsbury Laboratory to the University in December 2010 marked the end of the main building programme and the consequent start of an intensive period of work for the Garden. The horticultural team were able to move from temporary accommodation into the new re-provisioned areas including tool sheds, machinery store and staff facilities. For visitors, the new Garden Café located as a southern wing to the main Laboratory gives a wonderful light space with views to both the Laboratory and out into the Garden. One of the key landscapes associated with the Sainsbury Laboratory is the Cory Lodge Lawn, a harmonising space between the heritage Garden and the contemporary architecture. Although planting of the Cory Lawn was much delayed by the adverse winter weather all was ready for one of the highlights of the year, the official opening of the Sainsbury Laboratory by Her Majesty The Queen, accompanied by the Chancellor of the University, the Duke of Edinburgh, on 27 April 2011. On a warm spring day, the Queen was welcomed by members of the public, school children and Garden staff and enjoyed a tour of the Laboratory before unveiling a commemorative plaque.

The Sainsbury Community Arts Project, funded through the Percent for Art levy on the construction of the Laboratory, has enabled us to continue developing creative initiatives designed to encourage local disadvantaged or hard-to-reach groups to come in, explore and enjoy the Garden. One of the most inspiring projects was the creation of a children's story book, *The Magic Brick Tree,* by young carers in Cambridge. Based around a mature pear tree with a brick wall inside the trunk, an example of an old horticultural practice once used to fill large wounds, it told the story of a strange kingdom hidden behind the bricks. It's a wonderful example of how others can have a completely different perception of a specimen in the collections, and how the Garden can inspire people in so many different ways.

In July the Garden hosted a successful Bioblitz with visitors and experts joining forces for 24 hours to discover and record the wildlife in the Garden. Surprises included alien land snails in the Glasshouses and finding a specialist parasitic hoverfly of hornet larvae. Furthering our understanding of the Garden's wildlife is an essential part of ensuring we continue to manage it in an appropriate way.

One of the major challenges for the horticultural team was the extreme and often adverse weather. Winter came early with snowfall by early December and a prolonged period of cold weather lasting into the New Year resulting in some of the first winter losses within the collection for over a decade. By March, with rainfall well below average, we entered a period of a prolonged spring drought with some of the lowest rainfall totals for 163 years with little rain until June. The Garden frequently experiences hot dry periods, although rarely so early in the year and for so long. Our established specimens mostly seem able to tolerate such periods with losses restricted to plants suffering from pest or disease issues.

This year to December 2011 has proved record breaking for visits with numbers exceeding 200,000 for the first time. In 2012 we will celebrate the 250th anniversary of the founding of the original Botanic Garden in 1762 on what is now the New Museums Site. The land was given 'for the purpose of a public Botanic Garden' so it is appropriate that the current Garden continues to be such a popular place for the people of Cambridge.

Tim Upson – Curator and Acting Director

The year in pictures...

PHOTOGRAPH BY MIRANDA GROVHURST

Pupils at the Red Balloon Centre, an alternative school for bullied children, make a music video, *The Grasshopper's Green Herbarian Band*, as part of the Sainsbury Community Arts Project

PHOTOGRAPH BY TIM LIDSON

Sharp December frosts on *Pyracantha* and prolonged snowfall turn the Garden silver

PHOTOGRAPH BY SHERIDAN HANLEY

The Winter Garden enjoys substantial media coverage.

PHOTOGRAPH BY NIGEL LUCKHURST

Artist Norman Ackroyd RA installs Galapagos on the south wall of the new Garden Café in the Gilmour Wing of the Sainsbury Laboratory

PHOTOGRAPH BY NIGEL LUCKHURST

PHOTOGRAPH BY NIGEL LUCKHURST

Visitors to the Garden and local school children welcome the Queen and the Duke of Edinburgh to the Botanic Garden in April to open the Sainsbury Laboratory Cambridge University

PHOTOGRAPH BY JULIE TOY

Trainees on the Cambridge Certificate in Practical Horticulture and Plantmanship enjoy a propagation lesson in new behind-the-scenes facilities

PHOTOGRAPH BY IRSAN NISJAM (SIR CAM)

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The Garden holds a marathon 24 hour Bioblitz in July whereby experts and members of the public joined forces to log the wildlife of the Garden

Trainee Bridget Ibbs re-pots and weighs the Titan Arum corm

PHOTOGRAPH BY MARCUS HARPUR

The new spring bulb belt is enjoyed by record-breaking numbers of spring visitors

PHOTOGRAPH BY NANCY HARRISON

Watch the birdie! All eight blue-tit chicks fledge successfully from our camera nest-box, watched on-line

PHOTOGRAPH BY NIGEL LUCKHURST

The Duke of Edinburgh meets Professor John Parker, Phil Starling and Adrian Holmes, one of his last official engagements before stepping down as Chancellor of the University

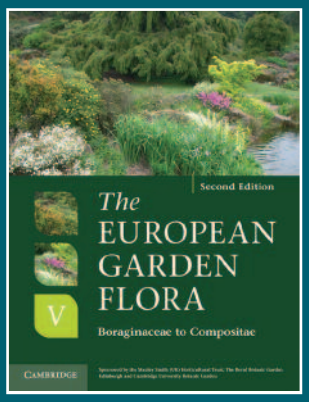
PHOTOGRAPH BY NIGEL LUCKHURST

The Queen unveils a plaque commemorating the opening of the Sainsbury Laboratory Cambridge University

PHOTOGRAPH BY IHSAN ASLAM (SIR CAM)

PHOTOGRAPH BY JULIET DAY

The Garden opens late on summer evenings to present four Cambridge Summer Music Festival proms



The Garden hosts the launch of the fully revised European Garden Flora in September

A New Landscape

PHOTOGRAPH BY HOWARD RICE

THE COMPLETED LANDSCAPE HARMONISING THE CONTEMPORARY AND HERITAGE

The iconic Sainsbury Laboratory, dedicated to understanding plant development and diversity, sits at the centre of the historic landscape of the Botanic Garden and in close proximity to the charming, Grade II-listed Cory Lodge. Originally the Director's residence, Cory Lodge was designed by the influential Cambridge architect, MH Baillie Scott. It now serves as offices for the horticultural and curatorial teams. Landscape architects, Bradley-Hole Schoenaich Landscape Architects (BHSLA) were commissioned to create a new landscape for Cory Lawn that would, through structure and planting, become the unifying, harmonising principle between the heritage of Cory Lodge and the contemporary design of the Sainsbury Laboratory.

The new design retains the large central grass lawn, which perfectly sets off the Arts & Crafts Cory Lodge. The original sloping flanks to the lawn have been re-graded and are now segmented by rectangular yew tables, clipped at differing heights into interlocking shapes. This strong design reflects the structural formalism of the Sainsbury Laboratory and yet frames Cory Lodge.

The formal architectural yew tables contrast with the informal exuberance of the herbaceous plantings providing colour and interest through the year. The plantings are designed as a basal matrix of grasses, ferns and ground covering perennials punctuated by flowering emergents providing an ever changing palette of flowers through the year. Snowdrops precede tulips, followed by irises, salvias, asters and late-flowering red hot pokers, all against a foil of flowing foliage and the flowers of grasses. Even in winter, the architectural spent stems and flowerheads of the summer perennials extend the season, outlined in frost.

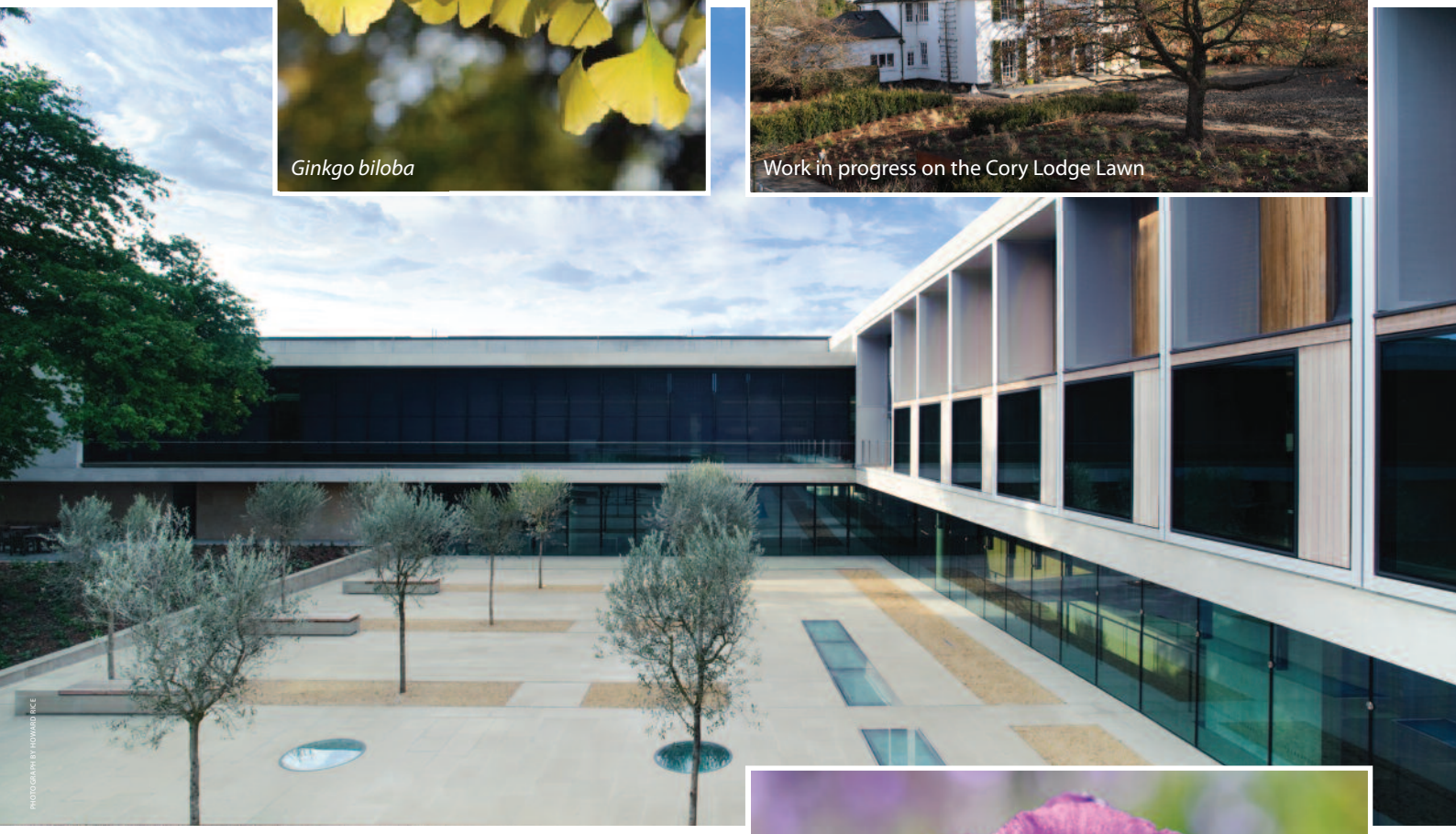
This new landscape can also be admired from the new Garden Cafe that occupies the southern wing of the Sainsbury Laboratory, known as the Gilmour Suite. Expanses of glazing give views to the Cafe Terrace where five Chinese limes, *Tilia henryana,* spaced along its length are being trained to provide shade to the tables underneath. Mounted onto an external wall is one of three artworks commissioned for the building – Norman Ackroyd's Galapagos.

PHOTOGRAPH BY TIM UPSON

Ginkgo biloba

PHOTOGRAPH BY HOWARD RICE

Work in progress on the Cory Lodge Lawn



PHOTOGRAPH BY HOWARD RICE

THE OLIVE COURTYARD

This huge mural of forty etchings portrays the wildlife, landscapes and plant life of the Galapagos Islands. This artwork was inspired by Charles Darwin and his visit to these islands that helped formulate his theory of evolution.

Groves of trees are a feature of the landscaping and are planted on a grid that overlays the structure of the building. At the centre of the Laboratory is an Olive Courtyard, planted with 12 of these Mediterranean trees likely to thrive in this hot, south-facing courtyard and chosen to complement the architecture of the Laboratory. The entrance to the Laboratory on the north side is planted with 27 *Ginkgo biloba,* or maidenhair trees, selected since they represent one of the earliest extant plant lineages, and are also able to thrive in the conditions. The leaf of this tree also forms part of the logo of the Department of Plant Sciences.

Tim Upson – Curator and Acting Director

PHOTOGRAPH BY HOWARD RICE

Iris barbata 'Sable' planted as an emergent

Horticultural Projects

PREPARING THE PATH THROUGH THE MEDITERRANEAN BEDS

Bulbs are one of the harbingers of spring around the Garden and this autumn over 15,000 bulbs were planted to improve the display even further. This included the early flowering *Narcissus pseudonarcissus* and later blooming *Narcissus poeticus* both used to join existing clumps so to encircle the heritage Garden with a colourful and long lasting spring display. In other areas the planting palette has been further enhanced with *Camassia, Fritillaria meleagris,* the snakeshead fritillary, and *Tulipa sylvestris,* wild tulip. These plantings were made possible by a generous gift made through the Giving in Memory fund and those who helped plant: Friends of CUBG and volunteers from our corporate friends, Mills and Reeve LLP, who worked alongside our own horticultural staff.

Plants from the Mediterranean Basin have long been a major feature located in a series of beds at the western end of the Glasshouse range. Many of the species are well suited to the Cambridge climate and the periods of hot dry weather we expect in most years. Phase one of a plan to regenerate and expand the Mediterranean plant display was successfully completed this year. Several existing island beds adjacent to the Limestone Rock Garden were joined, grass paths being replaced by a new gravel path taking visitors through the heart of the beds. To achieve this, the National Plant Collection of *Alchemilla* was relocated into the Rock Garden, a chance to find the ideal niches to grow these plants, together with the *Saxifraga* collection rehoused into a new bed of its own. Structure was created with specimens of *Spartium junceum* and *Cupressus sempervirens* dotted through the area. Part of the bed has been dedicated to plants from Cephalonica and northern Greece, the result of material received through a collaboration with the Balkan Botanic Garden, near Thessaloniki. These new beds complement the existing plantings which include economic species associated with the area and examples from the other Mediterranean climatic zones in Australia, South Africa, Chile and California.

Whilst Mediterranean plants thrive, providing the ideal conditions for cool loving alpines is more difficult. To help prevent the alpine display or Mountains House from overheating in the summer cedar shading was installed at the southern end through a generous grant from the Hendry Bequest of the Alpine Garden Society. This should help us to provide the cool and slightly shaded conditions for alpines to thrive.

One of the major horticultural challenges faced this year was the weather. The winter of 2010/11 proved to be the hardest since the

PHOTOGRAPH BY HOWARD RICE

Bulb planting

PHOTOGRAPH BY JERRY HARPUR

New composting facility

mid 1980s with over a month of freezing weather through December and into January. During December, 23 air frosts were recorded, the coldest night being 19th December at -10.9°C, the coldest December day since 1981. Snow fell on several occasions and, given the low temperatures, carpeted the Garden for many weeks. The spring revealed wide-ranging damage to some elements of the plant collection. Many Mediterranean plants previously untouched in recent winters suffered frost scorch, whilst *Cordyline australis* was cut to ground level. Thankfully the large specimens in the Systematic Beds resprouted later in the spring having reached over 3 metres without check in the last 10 years.

PHOTOGRAPH BY JULIET DAY

Cedar shading installed to Mountains display in Alpine House, thanks to a grant from the Hendry Bequest of the Alpine Garden Society

The cold winter was followed by a dry spring with only 21.1 mm of rain falling during March, April and May, relief only coming in June. The evidence of the drought conditions was all too clear with little growth of the long grass meadows and many trees, shrubs and herbs flowering 3-4 weeks early and lasting for just a short period. The Garden has a policy of not watering established plantings so to encourage deep rooting, and this helps minimise losses due to drought.

The horticultural team took over new facilities following the completion of the Sainsbury Laboratory building. This included a new nursery for hardy plant material to complement the Venlo glasshouse housing the reserve collections and propagation facilities reprovided at the beginning of the building programme. The Garden also took over new replacement Experimental Glasshouses, part of a block shared with the Sainsbury Laboratory. These new facilities will help the Garden to fulfil its role of facilitating research by enabling plants to be grown under a variety of conditions. The facilities have already been used to grow *Antirrhinum, Cleome* and *Lavandula* in support of research programmes.

Adjacent to the new Experimental Glasshouse are composting and storage facilities. These are vital to the efficient running of the Garden providing space to receive and store gravel, sand and other materials for developments. The new composting area is a series of bays with robust railway sleeper walls supported between steel girders. This enables all green waste to be recycled on site through shredding and composting to provide material for mulching and soil improvement. A further bay allows for the chipping of woody material providing further mulch or for surfacing woodland paths. These new facilities were particularly welcome as during the construction of the Laboratory building skips were used to take green waste off site for composting which was both expensive and constraining to the running of the Garden.

New staff and equipment storage facilities were also handed over to the Garden as part of the reprovision associated with the construction of the Laboratory. This includes a staff room with associated changing facilities, a base for both the horticultural team and a central place for all to meet. This forms part of an operations hub together with tool sheds and a replacement barn for equipment storage and maintenance.

Tim Upson, Curator and Acting Director

Outreach Report

and Friends of Cambridge University Botanic Garden

FRIENDS IN FRANCE 2011

The Outreach office encompasses Friends of the Garden, administration of the Education programme and Volunteers including co-ordinating the Guides programme and booking. In March 2011 we welcomed Heidi Bradshaw as the first Outreach Assistant.

Friends' membership continues to increase with a dramatic surge early in 2011 following the advent of an unusually warm spring. By the end of August there were 4,313 Friends. Joint memberships comprised 1,501 applications and single memberships 1,311.

A highlight of the Friends' year was the Garden's Annual Lecture held in the Queen's Lecture building at Emmanuel College in November. Professor John Parker gave a fascinating lecture "Visiting Galapagos – the response of a Darwinian biologist" to a large audience of Friends and their guests who enjoyed photographs and a presentation on the dramatic and exciting geology, botany and zoology of the Galapagos Islands. Through Professor Parker's considerable knowledge and expertise it was possible to explore the life-changing impact that this remote archipelago had on Charles Darwin 175 years ago. It was a fascinating evening culminating with refreshments in the beautiful surroundings of the Old Library. Other notable activities involving Friends were the 'Folklore and Plants' tours in December led by Garden Guides; 'Spring plants' tours in March led by Dr Tim Upson; 'Early bird' tours, which included breakfast at the new Garden Café, led by Dr Nancy Harrison and Professor Nick Davies in April and May and a 'Behind the scenes' tour led by Sally Petitt.

The Volunteer Committee compiled an interesting programme of outings and events for Friends and their guests including trips to Nymans and Borde Hill, Houghton Hall and Peter Beales (Roses) and to the RHS Hampton Court Palace Flower show. A residential trip to France took place in June where participants visited the Gardens of the Loire and Chaumont. Grateful thanks go to the Volunteer Committee, Emma Daintrey, Jenny Leggatt, Pam Newman, Richard Price and Elizabeth Rushden for their work on behalf of all Friends and Volunteers.

Garden Guides provided guided tours for 2,909 people, a total of 279 individual groups. There are 24 qualified Garden Guides and 4 trainee Guides. All are volunteers who give their time and experience for the benefit of the Garden. Their commitment and enthusiasm is greatly appreciated by staff and visitors alike.

Emma Daintrey – Outreach Administrator

Education

ART WITHOUT SIGHT WORKSHOP

The Botanic Garden education programme offers a diversity of activities across all age ranges and abilities helping people to discover the Garden and the importance of plants. We continue to be indebted to our volunteers, without whom it would not be possible to run the number and scale of the activities that we now offer. Our volunteers help out with assisted school visits, drop-in family Saturday events, and school holiday activities. We would like to extend our thanks to you all.

Schools

We introduced some major changes to our school and college policy this year, the most significant being charges for certain categories of visit for the first time. This became necessary because of alterations to the Garden's financial structuring, meaning that our educational activities now need to work towards a degree of self–funding. We have also introduced a new 'level' of visit, by creating a range of resource boxes that teachers can order in advance and pick up on the gate. Each box contains a lesson plan, notes and support materials, which enable teachers to deliver these activities without the assistance of an Education Officer. Charges are now made for all assisted visits and for those that make use of these resource boxes. Unassisted visits remain free of charge, as do pre-visit planning meetings for any teacher wishing to bring their group to the Garden. This ensures that there is still the opportunity for schools to enjoy a free educational visit to the Garden.

Having seen a considerable rise over the last decade, our school and college visitor numbers have now levelled off in the region of 9000 per year. Approximately one third of visits are directly assisted by the Education department, with support from our dedicated volunteers. There was some concern that the new charges might prevent schools from visiting, but this has not proved to be the case.

Lifelong learning

Our programme of courses offered the usual favourites, encompassing plant identification, horticulture, creative workshops, botanical illustration and willow work. We introduced a new series of wildlife workshops, which offered participants the opportunity to learn about bees, wasps and dragonflies, as well as the working practices we adopt here in order to encourage wildlife into the Botanic Garden.

Community

At our Big Draw event in October, 'Me as a plant', children's imaginations ran riot as they imagined what they would look like if they were a plant. During the October half-term we ran a mini apple

Education

SCHOOL VISIT NOVEMBER 2010

day with tasting sessions, mask making, and apple printing. The United Nations designated 2011 as International Year of Forests, and in recognition of this we delivered four 'Making a Forest' workshops over the February half-term. These began with some tree-inspired drama, after which participants learnt about 3 key types of forest and then created their own model forest. The theme for this year's Science Festival was 'Science for Life' and once again we joined the Department of Plant Sciences on the Downing Site. We offered hands-on activities for families including making paper plant pots for sowing feverfew seeds and scented bath fizzers. A display of plants used in medicine with appropriate information enabled participants to complete a 'World medicine safari quiz'.

During the Easter holidays we ran our 'Easter Extravaganza' – 3 days of trails, passport stamping, face-painting, Easter bunny drawing competitions and chocolate rewards. Over the summer half term in June we ran two Dragonfly workshops, in collaboration with David Chandler, a local freelance writer and environmental educator.

For the summer holidays we put on a 'Flower Power' event over four days in August. There were a range of drop-in, hands-on activities available, including making lavender bags, learning about honeybees, exploring the plants in the scented garden, and hand-printing flower pictures. We were also joined by the Fairyland Trust, whose fairies ran workshops making crowns and books.

Our family 'drop-in' art sessions continued to run on the first Saturday of the month, with much success and a good mix of loyal regulars and newcomers.

Sainsbury Community Art Programme

Our community art project, funded through the Percent for Art levy continues to welcome groups to the Garden to participate in artist-led workshops. With an emphasis on working with local people, this year we have enjoyed working with a range of organisations including the Red Balloon Learner Centre, CamSight, Centre 33, Cambridge Celebrates Age, The Centre at St Paul's, Chernobyl Children's Life Line and local schools.

All art projects have been inspired by plants, horticulture and the Garden itself. One of the most memorable projects involved children from the Red Balloon Learner Centre. This local charity provides an 'intensive care' full-time education for children aged between 9 and 18 who are unable to go to school because they have been severely bullied. The children came to the Garden once a week over a four week period and were led by members of the Insect Circus, a quirky travelling museum and acrobatic troupe.

Me as a plant

Together everyone worked to make a music video to accompany the song 'Octopus' by Syd Barrett, a founding member of Pink Floyd. The lyrics mention a "Grasshoppers Green Herbarian Band" and so it was decided that the video should feature an insect band including a grasshopper, beetle, wasp and butterfly. After weeks of costume making, storyboarding and planning, the sessions culminated with a day of filming in the Botanic Garden. The surreal video can be viewed on YouTube **http://bit.ly/uJyVxt**

In another project, local school children created mosaics for permanent display in the Schools' Garden.

Schools' Gardening at the Botanic Garden

Cambridge University Botanic Garden was one of the first cohort of gardens to become an accredited Growing Schools Garden (GSG). Launched under the Growing Schools initiative and jointly managed by Botanic Gardens Education Network (BGEN) and Farming and Countryside Education (FACE), the GSGs scheme is the gateway to a network of Growing Schools Gardens throughout England that:

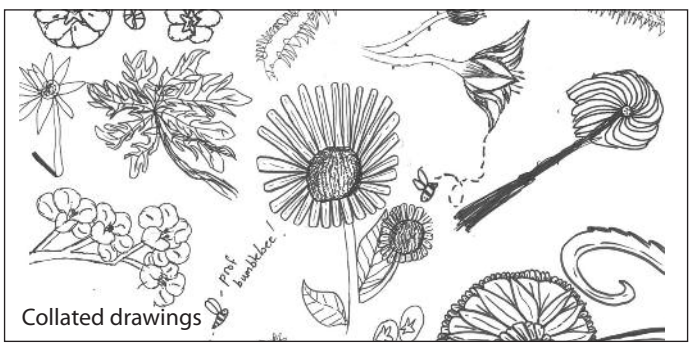
- Exemplify good practice, including risk management, in children's learning in the natural environment
- Provide training for teachers and educators to develop outdoor classrooms for learning
- Provide access to gardens that offer a range of plant displays and opportunities for learning outside the classroom

In October 2010 and March 2011 two continuing professional development day courses for teachers and teaching assistants were held at the Botanic Garden run by Botanic Garden educators on behalf of the Royal Horticultural Society (RHS). The first was 'Setting up a School Garden and Gardening Club' where people learnt about designing a growing space within their own setting. They learnt how to set up and maintain an organic garden, with crops that excite while suiting school term times. The logistics of learning outside the classroom were discussed and the basic building blocks of how to run a Gardening Club reviewed. The second training day covered 'Cross-curricular teaching in the Schools' Garden', where attendees were invited to find out how to unlock the full teaching potential of their existing outdoor spaces. During the day participants were encouraged to reflect on the outdoor environment recognising its value as a teaching resource throughout the year.

Guides' Training

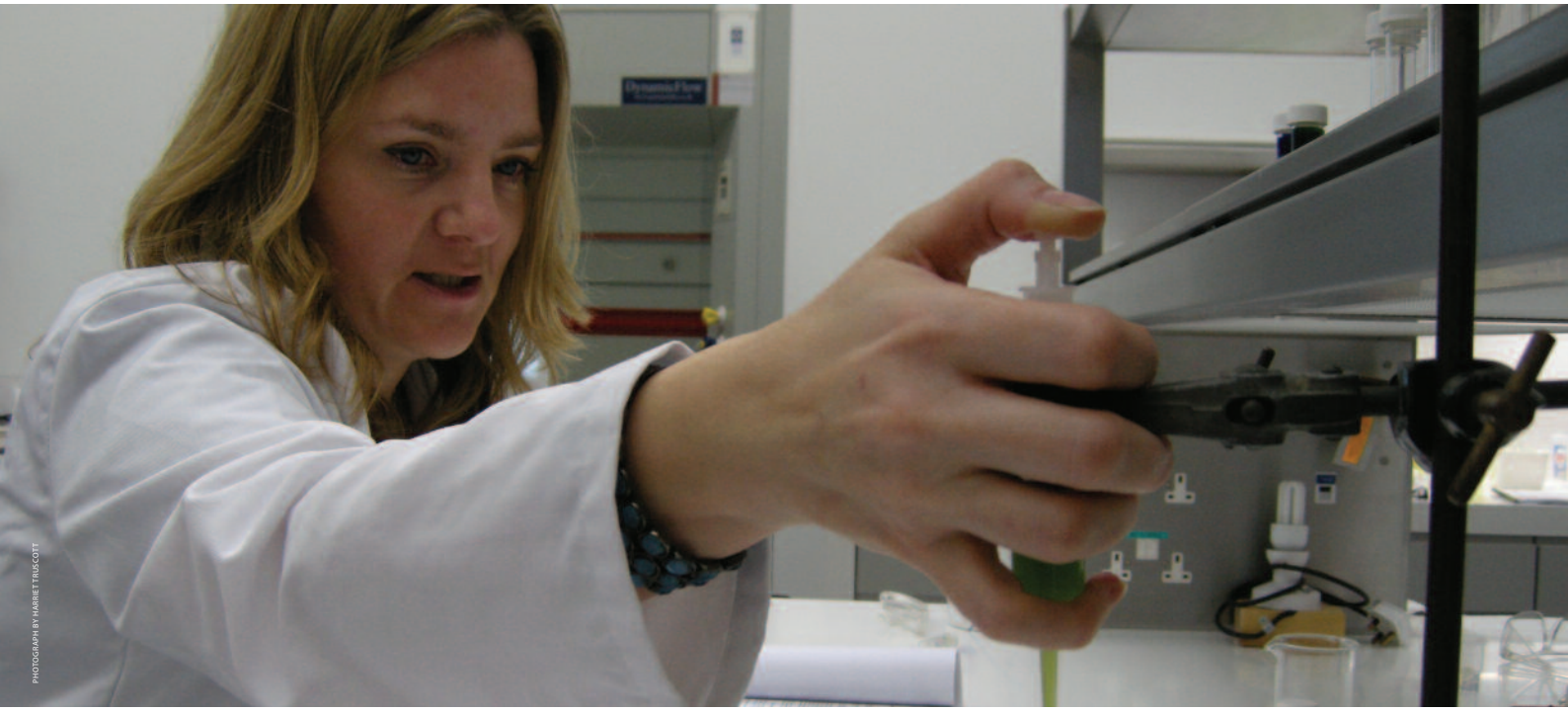
This year we developed a new training programme for the guides of the Botanic Garden, in collaboration with Richard Price. We have developed a programme made up of 14 modules that cover different areas of the Garden, four of which are compulsory and so must be completed by guides in training before they can qualify. The remaining 10 modules are optional, and are offered on a rolling programme. Any guide (trainee or qualified) is welcome to attend these training modules, which provide an opportunity for ongoing training and professional development. Each trainee guide is still paired up with a mentor who offers support and is able to answer questions and share the benefits of guiding experience. Finally trainee guides are assessed preparing a tour designed to last for one hour, the content of which is their own choice, but must include some coverage of the Garden's history. This is given to a small group consisting of their mentor, other qualified guides, the Training Co-ordinator, the Head of Education and other members of the CUBG staff.

Dr Karen van Oostrum, Head of Education,
Dr Judy Fox and Dr Sally Marsh



Collated drawings

Science and Plants for Schools



PHOTOGRAPH BY HARRIETT RUSCOTT

NUFFIELD TEACHING FELLOW VICKI COTTRELL AT THE SAINSBURY LABORATORY, CAMBRIDGE

Science and Plants for Schools (SAPS) works to strengthen plant science education in schools and colleges throughout the UK by invigorating the curriculum, supporting teachers, and encouraging outreach activities by plant scientists. SAPS is funded by the Gatsby Charitable Foundation and joined the Botanic Garden in 2009 to take advantage of its facilities and collections, after a strategic review of its strategy and operations.

At SAPS we aim to help teachers engage their students with plant science. We have spent the last year ensuring that our resources are comprehensive and up-to-date, and easily accessible from our new website, which we launched in April 2011. We now have more than 200 activities, ranging from investigating photosynthesis using algal balls, to virtual ecology practicals, all tagged with curriculum relevance and linked to contemporary news stories. We've had some great feedback and are continually adding new resources and topical research so that teachers and technicians will always have something fresh to bring to their plant science lessons.

SAPS acts as a hub bringing together communities of teachers and technicians interested in plant science. Our SAPS Associates scheme is free for them to join and offers a twice termly newsletter brimming with ideas and inspiration, as well as the opportunity to bid for small grants to develop their own projects that can then be shared more widely. Numbers of SAPS Associates are growing all the time, and we are particularly pleased that so many trainee teachers are registering with us. We also keep in touch with busy teachers via Twitter and Facebook so that we can let people know of events and news of interest.

Key achievements:

- Intensive work with other biology organisations and exam boards meant that new Biology GCSEs starting in September 2011 had enhanced plant science content.
- Launch of a new SAPS website in April 2011 with a fresh appearance, clear categorisation of 200+ resources, and links from teaching materials to contemporary news and research. Since the re-launch, a significantly higher proportion of visitors are from the UK, are spending increasingly longer periods on the site and are viewing a greater range of our resources.

PHOTOGRAPH BY HARRIET TRUSCOTT

Sixth form students visit the Sainsbury Laboratory during the Sutton Trust Summer School

PHOTOGRAPH BY ALEX ORROW

Girl and boy looking at algal balls close up.

GATSBY PLANTS SUMMER SCHOOL 2010

Post-16 biology teachers attending the Gatsby Plants Summer School 2010.

- Increased SAPS support for secondary science teachers and technicians including: expansion of the SAPS Associates scheme and launch of SAPS Associates Awards scheme; SAPS practicals introduced into more teacher training courses; all resources linked to current curriculum topics; an 'Ask the Expert' function on the website; and a small cohort of dedicated SAPS Ambassadors recruited among teachers and educationalists, mainly through a partnership with the Gatsby Plants Summer School for undergraduates.

The year in numbers:

- 1300 teachers and technicians from around the UK registered as SAPS Associates.
- 3100 people in science education receiving our half-termly SAPS e-newsletter.
- 8 new teaching resources added to the SAPS website, including 'An investigation into leaf surface temperature' and 'Investigating gravitropism with dandelions'.
- SAPS/Nuffield Education Fellow joined the team – Vicki Cottrell, Head of Science at Didcot Girls' School.
- 100 plant scientists engaged with ideas about supporting education, including visits to Rothamsted Research, NIAB and Gatsby Plant Science meetings.
- 485 teachers and technicians directly supported through courses and meetings, particularly through events at the Association for Science Education annual meeting, CPD courses at the National Science Learning Centre, and Kew Bioscience evenings.
- 50 14-19 year olds inspired with plant science through events at the Botanic Garden including the opening of the Sainsbury Laboratory, Sutton Trust Summer School and DNA days for teenagers.
- 77 trainee science teachers surveyed on their readiness to teach plant biology in schools.

Ginny Page, Director

GATSBY Science & Plants for Schools

Syndicate and Cory Managers

Four meetings of the Botanic Garden Syndicate were held under the chairmanship of Professor Keith Richards. Syndicate members for the year were Professor Sir David Baulcombe, Professor Sir Tom Blundell, Professor Nick Davies, Dr Laurie Friday, Dr Ian Furner, Dr Beverley Glover, Mr Donald Hearn, Professor Nick Jardine, Professor Ottoline Leyser, Mrs Gina Murrell and Dr Jane Renfrew. The Secretary to the Syndicate was Professor John Parker until December 2010 and Dr Tim Upson Acting Secretary for the remaining meetings. The Syndicate met the Botanic Garden staff over tea and cakes following the July meeting and perambulation.

The Cory Managers met four times during the year under the Chairmanship of Professor Sir David Baulcombe. Managers for the year were Mr Michael Allen, Professor Howard Griffiths, Dr Alan Munro, and Mr John Stead.

Staff

A tea party held on Friday 26 November 2010 marked the retirement of Professor John Parker with many staff, colleagues and friends in attendance. The staff presented him with a turned wooden bowl made from the wood of an original *Cedrus libani* planted by the Garden's founder John Stevens Henslow. The tree had been removed because of structural problems. He was also presented with a set of Galapagos etchings reproduced from the art installation made by Norman Ackroyd for the Sainsbury Laboratory.

Mrs Diane Harrison retired from the Garden's Administration on 31st August 2011 having been part of the Enquiries team for over 10 years. Glasshouse assistant Miss Janet Jephcott left her post in February 2011 to take up a new position with the National Trust at Anglesey Abbey. We welcomed back Ms Mar Millan from maternity leave and Catherine Goss, employed as her maternity cover, continued to volunteer for the Garden. Mr Paul Abbott was welcomed on a temporary appointment to the horticultural team to cover the long term sickness of Mr Peter Kerley (who we were delighted to welcome back later in the year). Ms Suzanne Broomfield joined the Finance team in January to oversee income.

Reorganisation of the Garden's administration was completed in March 2011 with changes to the previous custodian team. In addition to the existing staff we welcomed several new members to the re-named Customer Service Assistants team: Miss Nichola Steele-Williams as a team leader; Mr Tom Arnold; Mr David Evans; Miss Phoebe Monk and Ms Jacqueline Riley. Miss Mairead Madden and Mr Guy Bettley-Cooke left the team.

Congratulations to the trainee horticultural technicians who successfully completed the Certificate of Higher Education in Practical Horticulture and Plantsmanship – Alexandra Brooks, Svenja Burckhardt, Rachel Dodds, Bridget Ibbs and Tim Judd. James Kettle completed his year's training.

Work experience students

L'École Nationale de la Supérieure de la Nature et du Paysage, Blois, France
4 April – 27 May, Cosette Meric

Connexions School Work Experience

28 March – 8 April, Eleanor Parkhill, Sawston Village College
6 – 17 June, Hana Regan, Soham Village College
4 – 15 July, Toby Hart, Comberton Village College

Botanic Garden staff activities

Dr Tim Upson has continued as a Trustee of PlantNetwork, as Vice-Chair of the Plant Conservation Committee of Plant Heritage and as Secretary of the Horticultural Taxonomy Group (Hortax). He represented Cambridge University at the first meeting of the Coimbra Group Botanical Gardens held at Padova, Italy in late May. This meeting for the first time brought together University Botanic Gardens belonging to the Coimbra Group of Universities and will result in a publication featuring these gardens.

Sally Petitt continued on the Advisory Committee of the Chelsea Physic Garden and Trustee of the Merlin Trust.

Helen Seal as Secretary to the Professional Gardeners' Guild Trust.

Several members of staff (Emma Daintrey, Judy Fox, Sally Petitt and Education Volunteer, Jenny Egbe) attended the PlantNetwork meeting and AGM on Volunteers in Gardens and Arboreta hosted at the University of Bath. In April Sally Petitt, Helen Seal & Heloise Brooke attended the Eighth International Rock Garden Conference in Nottingham.

Juliet Day continued as Chair of Great Days Out Around Cambridge and to represent the Garden at Love Cambridge meetings.

Judy Fox joined BGEN as a Director and has worked on the fund raising sub-group.

Visitors

The Garden hosted the Linnean Society annual Conversazione on July 11th 2011 where over 30 members enjoyed a tour of the Garden and Sainsbury Laboratory followed by afternoon tea.

Research supported and facilitated through use of the Experimental section and plant collections

Cambridge University Botanic Garden

Dr Tim Upson: Maintaining collections of *Lavandula* and *Rosmarinus* for Systematic Research

In collaboration with Tim Pankhurst, Plantlife Fenland Officer based at CUBG:

- Maintaining collection of Fen plants for conservation including testing 10 yr old *Viola persicifolia* seed for germination from Wicken Fen.
- The cultivation of Breckland plants including provision of material for outreach display at the Norfolk Show
- Regenerative Strategies for *Liparis loeselii* (Fen Orchid)

In collaboration with Kingfishers Bridge Project, near Ely:

- The cultivation of the Fen Ragwort, *Senecio paludosus* for potential re-introduction

Department of Plant Sciences, Cambridge

The following research groups were supported in their work and publications related to this indicated:

Dr David Coomes (Forest Ecology and Conservation Group)

- Provision of *Rosaceae* leaves, fruits and twigs to Tom Becker researching into Corner's rule

Dr Beverly Glover (Evolution and Development)

- Provision of plant material for the investigation of structural colour and iridescence in flowering plants
- Provision of glasshouse space to facilitate the computerised tracking of pollinator behaviour.
- Cultivation of plants for Dr Samuel Brockington (Post-Doctoral Fellow) for Royal Society meeting
- Provision of flowering material of early angiosperm lineages to Alison Reed (PhD student)

Professor Howard Griffiths (Plant Physiological Ecology Group)

- Maintaining collections of: CAM plants; Epiphytic bromeliads; *Miscanthus;* ancient and modern wheat varieties; ferns; orchids and sugar cane
- Provision of plants to L R Munns for Part II project on stomatal sensitivity

Publications related to this work: Kromidijk, J., Schepers, H.E. & Griffiths, H. (2010). Can the progressive increase of C4 bundle sheath leakiness at low PFD be explained by incomplete suppression if photorespiration? *Plant Cell Environment* 33: 1935-1948

Dr David Hanke (Plant Growth Substances)

- Cultivation of potatoes for hormone extraction

Dr Julian Hibberd (Molecular Physiology)

- Provision of *Cyperus, Flaveria, Dichanthelium, Panicum* to Britta Kuempers researching the development of leaf venation in species with C3 and C4 photosynthesis

Professor Alison Smith (Plant Metabolism)

- Cultivation of biofuel algae in buckets for Elena Kazamia (PhD student), investigating the stability of a symbiotic algal culture against bacterial invasion outdoors

Reference related to this work: Kazamia, E. and A.G Smith (in prep). Synthetic ecology – the way forward for sustainable algal biofuel production. *Journal of Biotechnology*

Dr Edmund Tanner (Tropical Ecology)

- Provision of material for part 2 projects undertaken by: Jess Baker, Sian Hughes and Zoe Li

University of Cambridge

Dr Peter Leggo, Department of Earth Sciences

- Growing biofuel plants in coal waste/amended zeolite

Robert Stiff, Forest Ecology & Conservation Initiative

- Provision of pine needles

Dr Harriet Hunt, McDonald Institute for Archaeological Research

- Growing experimental material to investigate the archaeobotany of crops and genetic diversity of millets *(Panicum miliaceum* and *Setaria italica)* and buckwheat *(Fagopyrum esculentum)* with Catharine Kneale

Publications and thesis related to this work:

Hunt HV, Denyer K, Packman LC, Jones MK and Howe CJ (2010) Molecular basis of the waxy phenotype in broomcorn millet *(Panicum miliaceum L.). Molecular Biology and Evolution* 27, 1478-1494.

Motuzaite-Matuzeviciute G, Hunt HV, Jones MK (2011) Experimental approaches to understanding variation in grain size in *Panicum miliaceum* and its relevance for interpreting archaeobotanical assemblages. *Vegetation History and Archaeobotany,* in press. DOI 10.1007/s00334-011-0322-2

Hunt HV, Campana MG, Lawes MC, Park YJ, Bower MA, Howe CJ, Jones MK (2011) Genetic diversity and phylogeography of broomcorn millet *(Panicum miliaceum L.)* across Eurasia. *Molecular Ecology,* in press. doi: 10.1111/j.1365-294X.2011.05318.x

MPhil thesis. Sarah J. Browncross (2011) Following a wandering weed: a pilot study of the efficacy of microsatellite markers for the archaeogenetic study of buckwheat *(Fagopyrum esculentum).*

Dr Walter Federle, Insect Biomechanics Workgroup, Department of Zoology

- Cultivating plants to investigate the biomechanics of insect-plant interactions in the genera *Macaranga* and *Nepenthes*

Publications related to this work:

Thornham DG, Smith JM, Grafe TU and Federle W (2011) Setting the trap: cleaning behaviour of *Camponotus schmitzi* ants increases long-term capture efficiency of their pitcher plant host, *Nepenthes bicalcarata. Functional Ecology,* doi:10.1111/j.1365-2435.2011.01937.x

Bauer U, Clemente CJ, Renner T and Federle W (2011) Form follows function: morphological diversification and alternative trapping strategies in carnivorous *Nepenthes* pitcher plants. *Journal of Evolutionary Biology,* doi:10.1111/j.1420-9101.2011.02406.x

Bauer U, Grafe TU and Federle W (2011) Evidence for alternative trapping strategies in two forms of the pitcher plant, *Nepenthes rafflesiana. Journal of Experimental Botany* 62: 3683-3692

External collaborations

Dr Nancy Harrison, Department of Life Sciences, Anglia Ruskin University

- Study of bird behaviour and breeding success within Botanic Garden

Dr Francine Hughes and Peter Stroh, Department of Life Sciences, Anglia Ruskin University:

- Germination of seed from cow and horse dung from the Great Fen Project

John Poland and Philip Oswald (Botanical Society of the British Isles)

- Provision of leaf samples *(Dryopteris)* for the publication: *'Vegetative Key to the British Flora'*

Botanic Garden publications

Morris, M. , David, J., Upson, T. & Buffin, M. (2010). Prioritisation for the conservation of cultivated plants – a new approach. *Sibbaldia* No.8.

Managing the Garden for Wildlife

PHOTOGRAPH BY TIM UPSON

CUSHIONS OF THE MOSS *TORTELLA TORTUOSA* ON CARBONIFEROUS LIMESTONE BLOCKS, WEST SIDE OF LIMESTONE ROCK GARDEN AND THE MOST IMPORTANT CAMBRIDGESHIRE POPULATION OF THIS SPECIES

The Botanic Garden is an important 40 acre green oasis within the city of Cambridge that has long been managed to benefit a wide range of wildlife. This not only enhances the Garden, but helps to create a balanced ecosystem virtually removing the need to control pests and diseases within the outdoor collections. The Garden is recognised as a city wildlife site for its invertebrates and bryophyte flora.

Understanding the wealth of wildlife in the Garden is not just of interest, but important to ensure appropriate management. Surveys of various groups have been undertaken – the bees and wasps are particularly well known due to the work of Peter Yeo (Garden taxonomist 1953-1993). In 2010/2011 several surveys were undertaken including two commissioned on bryophytes and invertebrates and culminating in a 24 hour Bioblitz on 22 July 2011, which found species new to us and to the many visitors who took part.

Small Mammal Survey

A small mammal survey was conducted by the Cambridgeshire Mammal Group led by Peter Pilbeam during autumn 2010 and summer 2011. Traps were placed throughout the Garden although with a concentration on the long grass meadows. Over the 72 trap nights a total of 51 captures were made dominated by wood mouse (39-95% of the total), with bank vole (2-5% of the total) also found. Wood mouse was present throughout the Garden in all the areas covered; bank vole was only present in the Bog Garden and in one area of rough grass.

Invertebrate survey 2011

A survey of the Cambridge University Botanic Garden was undertaken by invertebrate expert, Peter Kirby, in 2010 and 2011. Covering both spring and summer periods a total of 782 taxa were recorded, of which 41 are Nationally Scarce and 12 are Red Data Book species across a broad taxonomic range.

The total of bees and wasps, excluding the honey bee *Apis mellifera,* stands at 71. This includes many common and unsurprising species previously recorded, but an unexpected find was a thriving population of the wetland specialist *Macropis europea* feeding from yellow loosestrife *Lysimachia vulgaris* flowers in the Fen Display.

Records of Hemiptera, are particularly diverse and now amount to 142 species of Heteroptera (true bugs) and 83 of Auchenorrhyncha (hoppers). Perhaps the most interesting of the new records of this group are *Hypseloecus visci,* a recent addition to the British list feeding on mistletoe *Viscum album,* now widespread in the Garden, which was present in very large numbers on most of the mistletoe examined. Also noted was *Tuponia brevirostris,* an even more recently established species on tamarisk *Tamarix gallica,* for which this may be the first record outside the London area.

Increases in the records of some groups of Coleoptera (especially leaf beetles and weevils) and of gall flies (Tephritidae) were particularly encouraging. With 44 species of saproxylic beetles this was a significant increase on previous records and likely reflects the large amount of dead wood in trees on which these insects are dependent.

The Systematic Beds produce an interesting scatter of specialist phytophagous (plant feeding) species, including the bugs *Eupteryx artemisiae* and *Europiella decolor,* species which are very scarce in native habitats, but have been long known to feed on some garden *Artemisia.* The *Campanulaceae* were notable for the very large number of the small bee *Chelostoma campanularum* they had attracted. The Bee Borders in front of the glasshouses also proved productive, not only for flower-visiting insects, but also for very large numbers of the flea beetles *Longitarsus anchusae* (Nationally Scarce) and *L. exoletus* (local).

The full invertebrate list and report is deposited in the Cory Library.

Bryophyte survey

A bryophyte and lichen survey was undertaken by Jonathan Graham of Fenland Botanical Surveys over December 2010 and January 2011. This survey identified 84 species (12 liverworts and 72 mosses) compared to 116 historical bryophytes records (15 liverworts and 101 mosses) dating back to the early 1940s. In addition 41 lichen species were recorded. Although none are deliberately cultivated they are an important part of the collections and the Botanic Garden is recognised as a City wildlife site for its moss flora.

Two records of mosses *(Didymodon umbrosus* and *Leptobarbula berica)* were highlighted as of national importance and records of 6 species *(Calypogeia muelleriana, Ctenidium molluscum, Pleuridium acuminatum, Pohlia annotina, Tortella tortuosa* and *Trichostomum crispulum)* of local importance. A population of the moss *Tortella tortuosa,* thought to have been introduced to the Botanic Garden on imported limestone, is the most important within Cambridgeshire.

Thirty two species (3 liverworts and 29 mosses) out of the historical total of 116 bryophytes were not refound. Apart from species that may have been overlooked due to the surveying season, reasons for losses are likely to be varied: some introduced on imported limestone are unlikely to be viable in the Cambridgeshire climate; ruderal species whose habitat may have disappeared; and those recorded from artificial habitats such as glasshouse glazing bars that have now been lost. Nine species were new records: the liverworts *Calypogeia fissa, Cephalozia bicuspidata;* epiphytes *Frullania dilatata, Cryphaea heteromalla, Ulota crispa senso. lato.;* and four mosses likely to have been overlooked: *Brachythecium mildeanum, Cirriphyllum piliferum, Fissidens crassipes* and *Hypnum lacunosum.* Two further and also likely overlooked species, *Plagiomnium affine* and *Pseudocrossidium hornschuchiana,* were refound after a period of over 50 years.

The full bryophyte and lichen species lists and report is deposited in the Cory Library.

Bioblitz 2011

In collaboration with the University Museum of Zoology and conservation partners across Cambridge, the Botanic Garden hosted a 'Bioblitz' with experts and the visiting public joining forces to log the wildlife discovered over a 24-hour period from 5pm on Friday 22 July 2011. Activities ranged from bee identification workshops and bat walks in the evening to pond dipping in the lake. Even plants were recorded, but only those that have introduced themselves or self-seeded, rather than any deliberately cultivated under the Garden's collections policy.

Some groups such as spiders, slugs and snails have been conspicuously under-recorded in the past so it was pleasing that experts were able to fill these gaps. One of the big surprises were 'alien' land snails discovered in the glasshouses including species from Hawaii, *Hawaiia miniscula,* and *Gulella io,* originally described from the Royal Botanic Gardens, Kew before its discovery in its native Liberia. The rather rare shelled slug, *Testacella haliotidea,* was a key find, a carnivorous land slug with a small shell situated towards the rear. Also of interest was a hoverfly species that is a specialist parasite of hornet larvae, *Vespa crabro,* a species that has become conspicuously more common in recent years.

The Bioblitz species list, though not comprehensive, gave a clear picture of the species present in the Garden at mid-summer. Equally importantly Bioblitz brought the Garden's wildlife to a wider audience and it was just as important to see the excitement on children's faces as the moth trap was opened and revealed the night's secrets. An inventory of the species found has been published and is available on request.

Tim Upson – Curator and Acting Director

Funding

The finances of the Garden remained stable for the year with a total expenditure of £1.84 million against income of £1.91 million which included grants for major capital projects. The principal sources of income are the University of Cambridge, the Cory Trust Fund and trading activities that include admission income and Friends subscriptions. We are grateful to a grant from the Gatsby Charitable Foundation that supports Science and Plants for Schools (SAPS).

University income funded 34% of the Garden's pay cost against 42% from income generated from the Cory Fund (24%) and admission income (18%), excluding pay costs for SAPS. Admission income was up 4.67% and Friends' subscriptions 12.7% on the previous year. Donations from individuals, corporate friends and through the Giving in Memory programmes remain key incomes that allow new projects to be developed within the Garden.

Income/ Budgets		**£k**	**£k**
Funding Source	**Details**	**20010-11**	**2009-10**
University Support	Pay	649.0	624.4
	Non Pay	0.0	20.7
	Non Recurrent	172.7	143.0
Trust Funds	Cory Maintenance Fund (KIAR)	390.4	375.2
	Cory Capital Fund (KIAS)	49.6	47.5
	Other Trust Funds	12.3	11.2
Admissions Income	Gate takings and Tours	248.3 See Note 1	230.0
Earmarked Funds	Friends	100.6 See breakdown below	90.8
	Other to include Specific Donations	58.2	49.8
Project Grants/ Funding		103.7 See breakdown below	105.2
Education Courses and Events		49.8	31.9
Science and Plants for Schools		64.4	225.6
Donations – General		0.4	0.0
Other/ Miscellaneous income		12.8 See Note 3	12.1
Total Income		**1,912.1**	**1,967.4**

Breakdown of Income (Friends: Earmarked Funds)		
Friends of the Botanic Garden – Subscriptions	88.6 See Note 4	78.6
Friends of the Botanic Garden – Outreach programme	8.4	9.0
Friends 25 Fund	0.5	0.7
Investment Income and Interest Earned on Earmarked Funds Held	2.0	1.9
Other	1.1	0.6
Total	**100.6**	**90.8**
Breakdown of Income (Project Grants/ Funding)		
Schools Garden Fund and Project	3.5	0.4
Education Garden Room Project	100.0 See Note 5	0.0
800th Celebrations	0.0	1.3
Limestone Rock Garden Project	0.0	3.5
Community Art Project – % for Art	0.3	100.0
Other	0.0	0.0
Total	**103.7**	**105.2**

Notes

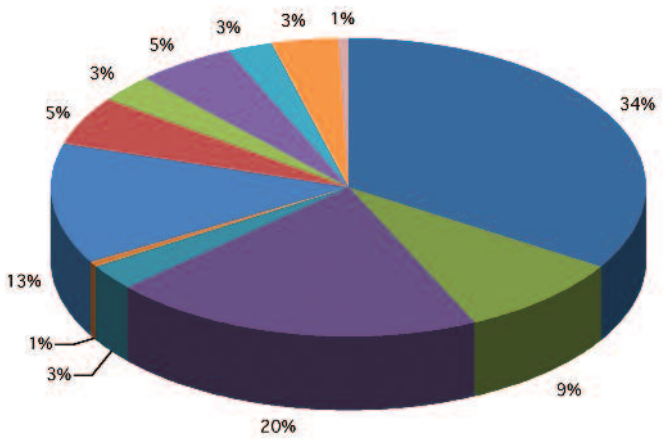
1. Admission income now includes 'Tour' revenue previously accounted for within the Friends. To enable comparison, Admission income alone increased by c.4.67% to £240.7k.
2. Education courses and events are now back to usual capacity following programme reduction in 2009-10.
3. Income is a direct re-imbursement of previous expenditure relating to the Sainsbury Laboratory - Cambridge.
4. Friends Subscription income reflects an increase of 12.7%.
5. New funding was received from the Gatsby Charitable Foundation for use towards a new classroom for schools, enhancing the provision of outreach.
6. Expenditure here has been offset by funding transfer of £27.5k. Expenditure in 09/10 was also offset by an income transfer (£88k)
7. Admission and Trust Fund income has been utilised to contribute towards general running costs. Figure also includes a one off payment increasing expenditure by £21k.
8. Expenditure offset by funding transfer towards essential modifications needed at the Botanic Garden Café in 2011/12.

* Calculations include minor rounding errors. Income has fallen overall but again, Admission and Friends Subscription income has increased, largely due to marketing, along with provision of improved visitor service, experience and outreach. Both pay and non-pay costs have risen to support infrustructure as needed.

Expenditure		£k	£k
Expenditure Type	**Funding Source**	**2010-11**	**2009-10**
Pay	University Support	587.2	618.8
	Trust Funds	377.3	342.1
	Admission	232.5	208.9
	Earmarked Funds: Friends	57.0	60.5
	Earmarked Funds: Other	0.3	0.0
	Project Grants/ Funding	3.3	3.3
	Education Courses and Events	0.3	0.4
	Science and Plants for Schools	173.2	109.7
	Donations – General	0.0	0.0
	Other/ Miscellaneous	0.0	0.0
		1,431.1*	1,343.6
Non Pay	University Support	254.0 See Note 6	205.0
	Trust Funds	20.1	7.0
	Admission	58.2 See Note 7	0.6
	Earmarked Funds: Friends	16.8	16.8
	Earmarked Funds: Other	-67.0 See Note 8	25.3
	Project Grants/ Funding	7.6	-4.8
	Education	39.9 See Note 2	18.6
	Science and Plants for Schools	70.1	8.3
	Donations – General	1.6	8.4
	Other/ Miscellaneous	11.1	15.7
		412.5*	301.0*
Total Expenditure		**1,843.6**	**1,644.5**

Breakdown of Expenditure (Project Grants/ Funding)		
Interpretation (inc signage of collections)	0.0	2.5
Schools Garden Fund and Project	0.6	0.1
Darwin Festival	0.0	-1.0
800th Celebrations	0.0	-1.9
Limestone Rock Garden Project	0.1	-4.6
Alpine Projects	2.9	0.0
Community Art Project – % for Art	7.4	3.3
Others	0.0	0.2
Total	**10.9***	**-1.5**
Total Income less Total Expenditure:	**68.5**	**322.8**
Less: Earmarked funds held for future planned expenditure	-68.0	-292.5
Funds reinvested by Cory and Trust Fund Managers	-117.5	-42.4
Funds remaining for discretionary use	**-117.0**	**-12.0**

Income 2010-11



Thank You

Gifts, donations and support received in Annual Report period 1 October 2010 – 30 September 2011

Giving

In Memory Gifts
- Mrs Jenny Leggatt in memory of Lee Skinner-Young who was an enthusiastic gardener, £3000
- Rita, Shamim, Natasha and Zareena Khan in memory of Sadie Kilvington, £50
- Margaret, William and Gabriella Schofield in memory of Great-Grandad Schofield, £5

Legacies
- Dr Roger Bishton, £1,000
- Dr Ann E Johnston, £5,000
- Margaret Lilian Tucker, £1,000

Individual Gifts and Donations
- Mr and Mrs Bragg, in celebration of their Diamond wedding, £200
- Mr Frederic Carl Rich, US$500
- Mr Greg Smith, £25

We would also like to thank all those Friends of Cambridge University Botanic Garden who continue to make gifts over and above the annual renewal subscription.

Grants, Trusts and Societies
- AstraZeneca Science Teaching Trust, £2,500
- Gatsby Charitable Foundation, £100,000

Corporate Support
- Mills & Reeve for late night openings, £800

Corporate Friends

- AAAS Science International
- Abbey College
- Alerme.com Ltd
- Arts Council England, East
- Bellerbys College
- Birketts LLP
- Brookgate Development Management Ltd
- Cambridge Assessment
- Cambridge Centre for Sixth Form Studies
- Cambridge City Council
- Cambridge Crystallographic Data Centre
- Cambridge Education Group
- Cambridge Programme for Sustainability Leadership (CPSL)
- Cambridge Royal Albert Benevolent Society
- Cambridge Silicon Radio Ltd (CSR)
- Cambridge University Investment Office
- Cambridge University Press
- Cambridge Water Company
- Cambridgeshire & Peterborough Probation Trust
- Cambustion Limited
- Cantab Capital Partners LLP
- Capita Architecture
- Churchill College
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- Dante
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- Department of Chemistry
- East of England Development Agency
- English Heritage
- Envisional Limited
- Eversheds LLP
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- Fauna & Flora International
- Geomerics Ltd
- Hills Road 6th Form College
- Hope Residential Nursing Home
- Institute of Biotechnology University of Cambridge
- John Lewis Cambridge
- Kennedys
- Linaro Ltd
- Marks and Clerk LLP
- Marshall Sports & Social Club
- Metis Arts
- Mills and Reeve LLP
- Mott MacDonald Ltd
- MPW (Mander Portman Woodward Ltd)
- Murray Edwards College
- Nash Matthews
- National Extension College
- Natural England
- NHS Cambridgeshire
- NIAB
- Open University
- Pembroke College
- Peters Elsworthy and Moore
- Ramboll UK Ltd
- Real VNC Ltd
- Saunders Boston Limited
- Savills (L&P) Ltd
- Sony Computer Entertainment Europe Ltd (SCEE)
- St Mary's School
- Stephen Perse Foundation (Perse School for Girls)
- Taylor Wessing LLP
- Thales E-Security Ltd
- The New School of English
- Transversal Corporation Limited
- True Knowledge
- Tucker Gardner
- University of Cambridge Computer Laboratory
- University of Cambridge Safety Office
- University of Cambridge Counselling Service
- Veebeam Limited
- Wolfson College
- Workplace Law
- WSP

Books Donated

Donated to the Cory Library by Professor John Parker

Ross-Craig, S. 1948. Drawings of British Plants. part 1, Ranunculaceae. Illustrations. Plants growing naturally in the British Isles.

Ross-Craig, S. 1948. Drawings of British Plants. part 2; Berberidaceae, Nymphaeaceae, Papaveraceae, Fumariaceae. Illustrations. Plants growing naturally in the British Isles.

Ross-Craig, S. 1949. Drawings of Plants. Illustrations. Plants growing naturally in the British Isles.

Ross-Craig, S. 1954. Drawings of British Plants. Illustrations. Plants growing naturally in the British Isles.

Long, G. (ed.) & A. Skillion (ed.) 2007. The New York Botanical Garden.

Toussaint, B. (comp.) 2008. Flore de la Flandre Française. Bailleul: Botanique National de Bailleul.

Funk, V.A. (ed.), A. Susanna (ed.), T.F. Steussy (ed.) & R.J. Bayer (ed.) 2009. Compositae. Systematics, Evolution and Biogeography of.

Glover, M. 2009. It's Time for Trees. A guide to species selection for the UK. Barcham Trees.

Carreau, E. (comp.) 2009. Guide des végétations des zones humides la région Nord-Pas de Calais. Bailleul: Le Conservatoire Botanique National de Bailleul.

Donated to the Cory Library by Sylvia Norton

Thompson, P. 2010. Seeds, Sex and Civilization. How the hidden Life of Plants has shaped our world.

Donated to the Cory Library by Bill and Rosa Tripp

Nanakorn, W. 2003. Queen Sirikit Botanic Garden.

Weather

It has been a period of extremes. October 2010 saw the first touch of frost for the autumn. November started mild, but ended on a cold note with many trees losing their leaf canopy abruptly. December saw its coldest night since 1981 with snow fall during the month. March, April and May 2011 proved to be an exceptionally dry period with only 21.1mm of rainfall during this quarter. Conversely, June and August saw near average rainfall. The twelve months ended with some very warm days during September.

	Monthly mean temperatures °C				
	Maximum		Minimum		Rainfall per month (mm)
Oct 2010	15.0	(21.0)	7.3	(-1.7)	55.2
Nov	8.9	(17.3)	2.7	(-8.1)	26.0
Dec	3.1	(8.3)	-2.7	(-10.9)	22.7
Jan 2011	7.3	(13.1)	1.9	(-3.1)	61.6
Feb	9.8	(14.8)	4.0	(-2.8)	31.4
Mar	12.0	(18.4)	2.9	(-4.2)	3.0
Apr	19.4	(27.4)	6.4	(0.9)	1.7
May	19.6	(24.8)	7.8	(-0.5)	16.4
Jun	21.0	(31.9)	9.9	(4.5)	64.0
Jul	21.4	(26.4)	11.1	(6.8)	34.5
Aug	21.4	(29.5)	11.8	(6.8)	48.9
Sep	21.3	(28.7)	11.1	(5.2)	24.9
Total					**390.3**

Figures in parenthesis are individual highest and lowest temperatures.

November was warm and dry with the fourth highest maximum (17.3°C) to be reached in the last 24 years. After the 26th the frosts became much sharper and we experienced our fourth coldest November night since 1904 (-8.1°C).

December was cold with 23 air frosts, several of them sharp, the coldest the 19th at (-10.9°C). There were 4 days when the maximum failed to get above freezing and the 18th saw 4cm of snow covering the Garden.

January 2011 saw most of the rain falling in the first 17 days and only 2.4mm after. Frosts were limited.

February was a dry, dull month and mild. There were 14 days with a maximum in double figures and frosts were limited.

March was a very dry month with only 0.7mm of rain until the 28th. The conditions meant that for the first time, we think, the three acres of the Systematic Beds were hoed by the end of March!

April continued to be very dry, even lower than the 1.9mm recorded in April 2007. With just 4.7mm recorded over these two months many parts of Cambridgeshire experienced the lowest March/April rainfall for at least 163 years.

May proved to be another dry month with drought conditions prevailing.

Despite above average rainfall in June and a respite from the drought average evaporation is high at this time of year leaving many plants still water stressed although the thunderstorms on 27th gave 11.2mm of rain increasing the annual total to just 178.1mm. The maximum temperature for the year was reached at 31.9°C.

July proved another dry month with less than the average rainfall.

August started warm with 29.5°C reached on the 3rd. In contrast the grass minimum dropped to 3.9°C on the 19th.

September experienced exceptionally warm temperatures with long-standing records for individual days broken on numerous occasions. During the week beginning 26th September, warm air and unbroken sunshine saw temperatures continue to rise. The Garden's maximum thermometer was not functioning during this period, but data recorded by the AT&T Laboratory weather station nearby recorded an average of 28°C for the week and a high of 29.1°C on 1st October. The rainfall total was about half the average.

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Front cover image: *Geranium x cantabrigiensis* 'Biokovo' by Howard Rice.
Back cover image: *Geranium* 'Brookside' by Howard Rice.
The paper used in this publication has been sourced from sustainable resources.