

ROYAL
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the Botanics

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Right on Target

Meeting our global conservation commitments

The Gaoligong Shan

A return to the magnificent mountains

Synthesys

Sharing skills across Europe



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Cover: *Androsace lanuginosa*, wild collected in the Himalayas. It can be seen on the Alpine Wall at the Inverleith Garden. Photo: Lynsey Muir.



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All gardens change and develop through time and our four gardens are no exception. RBGE started out more than three centuries ago as a physic garden, growing medicinal plants. James Sutherland, the Garden's first Regius Keeper, gathered medicinal plants from around the world. He and his successors were also Regius Professors at the University of Edinburgh until the late 1950s, when the Botany Department moved to the University and two separate posts reflected the diversification of plant sciences.

By the 21st century, RBGE had become a world-renowned centre of excellence in plant biodiversity. Botanic gardens are moving to the forefront of international efforts to halt the loss of our planet's biological inheritance. The Global Strategy for Plant Conservation, which I feel honoured to have helped to draft, is uniting the efforts of botanic gardens and other organisations around the world. In this issue you can read about the co-ordinated efforts of UK botanic gardens to conserve the plants of the British Isles.

RBGE's combination of world class science and our popularity with the public gives us a powerful voice. Our Gateway Project will capitalise on the unique opportunity this provides. Others are lending their voices. I am sure that James Sutherland would have been as delighted as I am that Karl Oparka, recently appointed as Regius Professor at the University of Edinburgh, shares our enthusiasm for communicating about the world of plants and is committed to working with us on the Gateway. Readers of the Botanics, I know, also share this passion and will continue to champion and support our important work.

Stephen Blackmore, Regius Keeper

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News



A new season of delights at RBGE's Gardens

As RBGE's three Regional Gardens open for the 2006 season, new plantings bring fresh flavours to the individual landscapes.

Opening first on February 1, Dawyck is famed for its carpets of snowdrops and daffodils. Another highlight in early spring is the flowering of the hardy Rhododendrons, such as *Rhododendron calophyllum* or *Rhododendron sutchuenense*.

As the season dawns at Logan on March 1, there will be an opportunity to view early results from the 2005 expedition to Australia, New Zealand and Tasmania. Logan staff are looking forward to establishing an elevated viewing platform overlooking the grove of tree ferns in the Tasmanian Creek.

Visitors to Benmore from March 1 will see changes to the Cryptomeria Glade where new Japanese plantings are being established, with forthcoming additions such as colourful Japanese maples that are stunning in spring as well as autumn.

More room at the Herbarium

More than 2.5 million plant specimens representing three centuries of plant collecting are currently housed at the RBGE Herbarium, and the collection continues to grow at a rate of 10,000 specimens a year as RBGE scientists document biodiversity around the world. The collection has long since outgrown the existing building, which was purpose-built in 1964 and so an extension is being built to develop 400 m² of extra space.

Construction work is well underway, with funding from SEERAD (Scottish Executive Environment and Rural Affairs Department) and when the extension is complete by the end of 2005, it is estimated that there will be 20% more capacity, which means extra cabinet facilities for an estimated 400,000 new specimens as well as more workspace and work stations for staff and visitors.

"We are trying to follow what is good about the existing Herbarium and carry it seamlessly through into the extension", says David Harris, the Herbarium Curator.

A Big Draw to the Botanics

Over 200 people of all ages turned out to take part in two Big Draw events at the Garden in October. Children, parents and grandparents were inspired by the exhibitions on show and worked with artists and volunteers to create a beautiful tree of leaves and animals at the Exhibition Hall while, at Inverleith House, paintings and montages were crafted for display. Events Co-ordinator Rosie Lewis said: "It was wonderful to see so many people inspired by our exhibitions and having so much fun. I hope that we are able to offer many more such family days next year."

You can learn more about Rosie's work at the Garden in our Day in the Life feature in this issue (see page 12).

Funds for aspiring alpine students

A new fund has been announced to provide grants and bursaries to support young people who want to pursue a career in horticulture, especially in alpine and rock garden plants.

Launched by the Scottish Rock Garden Club, the fund comes from the estate of the late Diana Aitchison, a keen plantswoman who worked at RBGE in the 1960s before setting up her own nursery in Northumberland.

It is anticipated that around £5,000 will be available for disbursement in 2006, with priority given to students following horticultural courses lasting one or more years. For details see www.srgc.org.uk The next deadline for applications is 31 March 2006.

Boost for DNA research

Scientists at the Royal Botanic Garden Edinburgh are part of a team who have been awarded \$800,000 US dollars from two trusts to continue the development of DNA barcoding of plants.

A consortium of 10 laboratories from around the world, who will receive funding from the A. P. Sloan, and the Gordon and Betty Moore Foundations, will each concentrate on different groups of species to find a common fingerprint that can be related to all forms of plant life. It is hoped that by uncovering a standardised region

of DNA, scientists will not only be able to instantly identify plants, but will also know if they have uncovered new varieties.

"This an extremely exciting time for biodiversity science," explains Dr Pete Hollingsworth. "It is highly likely that co-ordinated DNA-based approaches can help with the massive challenge of characterising the planet's biodiversity. We are delighted that RBGE will be involved with the process of thoroughly assessing the benefits and pitfalls of DNA barcoding in plants."

High in the northwest Highlands, a team from RBGE are scouring the tundra vegetation of the wind-blasted mountain tops in search of the tiny yellow flowers of Norwegian mugwort, a rare alpine only known on three Scottish mountains. They're hoping to collect seed to bring back to the Garden as part of PlantNetwork's 'Target 8' project. This is a nationwide programme in which gardens will cultivate threatened plants that grow in their local region and, by doing so, will develop the expertise to assist conservation projects. By creating local 'Noah's arks' for threatened plants, the project aims to ensure that no plant species becomes extinct.

To understand the 'Target 8' to which the project refers, we must first follow a trail of acronyms right back to the 1992 Earth Summit in Rio de Janeiro. This gathering created the Convention on Biological Diversity (CBD), the first international agreement to focus on the world's biodiversity, which included the commitment of all signatory countries to produce Biodiversity Action Plans (BAPs), identifying species and habitats of conservation concern.

Though these measures finally put biodiversity on the international agenda, many botanists were concerned that there wasn't enough emphasis on plant conservation. The botanical community responded with the Global Strategy for Plant Conservation (GSPC): a programme of 16 specific targets to be met by 2010. The GSPC was ratified by the CBD in 2002, committing all 183 signatory countries to achieving these ambitious targets to safeguard the world's plantlife.

Many of these targets directly relate to the work of botanic gardens, such as the clarification of taxonomy, education and conservation programmes and working towards a complete world flora. Target 8 is particularly relevant to botanic garden horticulture as it covers threatened species, *ex situ* collections and recovery and restoration programmes. It calls for each country to have: "60% of threatened plant species in accessible *ex situ* collections, preferably in the country of origin, and 10% of them included in recovery and restoration programmes."

"The Target 8 project is PlantNetwork's own response to the GSPC target,"



Right on Target

Botanic gardens across the country are working together on a new project which fulfils Britain's international conservation commitments and embodies the environmental motto: 'think global, act local', as Anna Levin reports.

explains Dr David Rae, a founder member of PlantNetwork and RBGE's Director of Horticulture. "PlantNetwork has hundreds of members, including almost all botanic and collections-led gardens in Britain and Ireland. We realised that if we all worked together, Target 8 could be achieved and even surpassed.

"The project embodies Target 8 but it also goes beyond it, to ensure that no species of plant in Britain and Ireland

becomes extinct. We have set our own targets within the target, and the project is focused on integrating *ex situ* and *in situ* conservation efforts. (*In situ* refers to the conservation of species within their natural habitat, while *ex situ* conservation means preserving species – or components of biological diversity – outside their natural habitat, such as in seed banks or botanic gardens). So it's also about researching and comprehending the needs of plants



Left: RBGE's Andy Ensoll with Keith Duncan from SNH, planting *Woodsia ilvensis* in the Cairngorms.

Below: One of the Scottish plants categorised as vulnerable: *Lychnis alpina* at Little Kilrannoch.

planning new accessions from the local areas. It's an example of the complex issues involved in plant conservation which the GSPC addresses: that conservation is not just a question of preserving species and habitat but of the genetic diversity within these species.

"We will collect the widest possible genetic diversity within each species," says David Rae, "and, to maintain genetic integrity, we will aim to keep plants of the same species from different populations in different gardens."

The Target 8 Project is co-ordinated by Project Officer, Natacha Frachon, who is based at RBGE. One of her first tasks was to plot all threatened species on a map of Britain and create species dossiers in which she recorded cultivation details, conservation status and any local conservation measures. This map was overlaid with a map plotting PlantNetwork's member gardens so each threatened species could be allocated their closest ark – the botanic garden which could potentially cultivate it. This will be refined to a list of just two or three species for each garden. Matching species and garden locations in this way should make cultivation easier as the climate and soil type should be most suitable, and it will also enable the public to see, and learn more about, locally-occurring but nationally threatened species. ►

in order to aid conservation of wild populations. While *ex situ* collections such as seed banks are important, they're only ever as good as the people who can grow the plants. So we will be cataloguing each plant's cultivation requirements, ultimately creating a database of how to cultivate all our endangered species."

The first step for the project was to find out how many of the species designated as threatened were already in cultivation. An initial survey of 113 botanical collections seemed promising, showing that of the 204 listed species, nearly 70% were already in cultivation.

"It seemed like we had nearly reached the target already!" says David Rae.

Conservation is not just a question of preserving species and habitats but of the genetic diversity within those species.

"However, a second survey of botanical records revealed that only 37% of these were wild-collected in Britain and that the genetic diversity was very low: most of the species were only represented by

one accession in a single garden. This is important as we need to know the origin of the plants for re-introduction programmes, and ideally

to ensure that they are from British stock: as Britain is at the western seaboard of Europe, there may well be significant genetic differences."

For the Target 8 project, this meant beginning again for most species, and





Left: Natacha Frachon (far left) with RBGE staff collecting *Pyrola media* in Aberdeenshire.

Below: Scottish dock *Rumex aquaticus* at Loch Lomond.

Right: *Ajuga pyramidalis*. IUCN category: vulnerable.

Below right: *Artemisia norvegica*; *Rumex aquaticus* in the wild; *Rumex aquaticus* seedlings in propagation in the Garden Nursery.

For Natacha, one of the most enjoyable aspects of the project has been visiting gardens throughout Britain and recruiting garden managers to the project.

"People talk about the botanic garden community, but really it's a family!", she says. "So many people know each other and many of those I've met working at gardens around the country studied at RBGE.

"I've been travelling extensively around gardens in Scotland and England and

wherever I go people are enthusiastic and keen to be involved in the project," she continues. "People want to do something tangible about conservation issues. The scale of environmental problems can be overwhelming but this is a relatively simple project on an achievable scale. It's practical, pragmatic, and *real* – these small steps fit into a bigger picture. For some of the smaller gardens, it has been particularly important to have a role to play in a global conservation initiative."

The project is still at an early stage and Natacha is currently recruiting 10 trial gardens to take on two or three plants each and provide feedback to refine procedures and protocols before the project is rolled out across the country. The organisers hope it will continue indefinitely, adjusting as species are added to – and hopefully removed from – the 'Red List' of threatened species, (a global inventory of the conservation status of plant and animal species). The procedures will be put into place in Ireland once their Red Data List is updated. The project also has the potential to spread further afield, becoming a template for other signatory countries to establish similar projects and meet their own commitments to the GSPC.

An important aspect of the Target 8 project involves botanic gardens working in partnership with local conservation groups to integrate and coordinate conservation programmes. Wildlife trusts, conservation agencies



We are making connections, linking horticulture and conservation, science and the general public.

and the relevant government departments have all been informed about the project and Natacha's species dossiers indicate where the target species are mentioned in national or local Biodiversity Action Plans. The project also hopes to stimulate public interest in threatened plants in local areas by ensuring the work is on public display with relevant interpretation.

"When I started touring it was good to see that so many gardens are already involved with local BAPs and conservation groups," says Natacha. "For example, Glasgow Botanic Gardens is working with the local BAP process, taking on seeds and propagating them. Others are not yet so well linked but are keen to be involved with conservation work: when I visit the smaller botanic gardens I can help make these links – I'm able to tell them they're not alone!"

"It's all about connections," Natacha continues. "We are making connections between different botanic gardens around the country; linking horticulture and conservation; science and the general public. That's why I find this project so exciting and important: it's bringing people with different knowledge and expertise to work together towards a shared objective – helping to maintain biodiversity." ■



Synthesys

With its world-renowned facilities, including the living collection, library and herbarium, RBGE has been a major player in a project called SYNTHESYS, which facilitates the sharing of resources and expertise between natural science researchers across Europe.

SYNTHESYS, ('synthesis of systematic resources') was launched in 2004 after 20 European natural history museums and botanic gardens successfully secured a five year grant structure from the EU's Integrated Infrastructure Initiative. SYNTHESYS funds access awards to enable researchers to visit partner institutions, as well as networking to ensure that collections and knowledge are shared.

The leading research institutions in each participating country are grouped together into 'TAFs' (Taxonomic Facilities). The UK TAF consists of RBGE, RBG Kew and the Natural History Museum. Together, Europe's 11 TAFs represent an unparalleled resource for taxonomic research, offering collections amounting to over 337 million natural history specimens, an internationally renowned taxonomic and systematic skill base as well as chemical analysis, molecular and imaging facilities.

The SYNTHESYS partners hope that the networking activities will broaden and deepen the relationship between all natural history facilities in Europe. Co-operation from natural history museums and gardens beyond the EU will also be sought, to ensure that best practice collection management and access are developed on a global basis.

Associate Professor Aloisie Pouličková

Palacký University Olomouc,
Czech Republic

Professor Pouličková came to the UK in October 2005 to further her research on diatoms, spending five days at the Natural History Museum and 55 days in Edinburgh working with RBGE's Senior Principal Research Scientist David Mann.

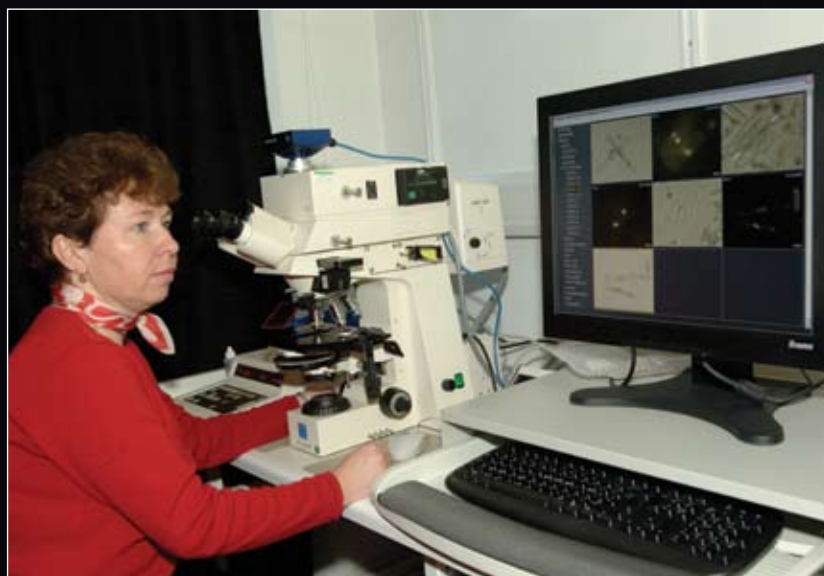
"I've been studying and teaching diatoms for many years," she explains, "First for my diploma thesis, when I was studying Biology and Ecology at University, then with a PhD in planktonic diatoms at the Academy of Science, and now I continue this work at Palacký University as a researcher and teacher. But all this time I worked in ecology, with diatoms which were long since dead! Diatoms are enclosed in elaborate silica 'shells', which last for thousands of years and these remains, cleaned in acid, are used to evaluate the ecology of a give locality, for example, to monitor changes in climate and water quality. So working at RBGE has been my first opportunity to study

This page: A fluorescent microscope image of the diatom *Pinnularia gibba*.

Inset: Associate Professor Aloisie Pouličková from the Czech Republic at work at the Garden's scanning electron microscope.

Above right: Fig wasp *Ceratosolen* emerging inside the fruit. Photo: Simon van Noort (Iziko Museums of Cape Town).

Below right: *Ficus sycamorus*, just one of the diverse range of fig species.



living diatoms in detail. When I saw diatoms reproducing for the first time I was so excited! After studying them for so many years and only working with dead material, it was just amazing!”

Her work with David Mann has focused on the reproduction of the diatom *Pinnularia gibba*. “Previously no-one knew how they were reproducing,” she says. “We isolated clones, found which were compatible and experimented with mating them. We were able to observe all stages of reproduction: taking pictures with light microscopes and observing the nuclei after ‘DAPI’ staining (which stains the DNA so the division of nuclei can be observed), and thanks to Frieda Christie (RBGE’s Electron Microscopist) we have also been able to use the scanning electron microscope.”

At the Garden, Professor Poulíčková enjoyed the luxury of focused time to spend on research, away from the phone and daily demands of her work at the University, and with access to the quality of equipment and facilities available at RBGE.

“I know I want to continue working in this field, studying live diatoms and reproduction, and have started to collect the equipment I need for this work. I have undergraduate and PhD students at home and I can bring the knowledge I’ve gained here back to share with them.”

Professor Kees Berg

National Herbarium Nederland,
Leiden, The Netherlands

For two weeks in October, Professor Berg could be found each day on the second floor of the herbarium, intently studying RBGE’s collections of fig species. An access award from SYNTHESYS enabled him to visit RBGE and contribute his expertise on fig identification.

Figs have been a focal point of Professor Berg’s research throughout his career, which has included 19 years at the University of Bergen as Professor of Higher Plant Taxonomy and 25 years at the University of Utrecht working on neo-tropical and South American plants.

“Figs are found almost everywhere in the tropical and subtropical world,” he says.



“There is so much diversity and some are quite peculiar life forms, such as strangling figs which climb like ivy and others with branches creeping along the forest floor. Their complexity appeals to me, and the fact that each species has its own pollinator, so it becomes a study of species-specific pollination and of evolution.”

Professor Berg explains how figs have an ‘enclosed inflorescence’ – flowers inside the fruit (“My students look at me as if I’m crazy when I first tell them that!”). Their sole pollinators are tiny wasps, which can only breed inside the fig – a mutual relationship which has evolved over millions of years. The fig wasps, only a few millimetres long, can just squeeze inside the fig through a tiny hole, though their wings and antennae are often lost in the struggle. Once inside, they lay their eggs and die. The next generation emerges inside the fig and remains there until they have developed and mated, then the males chew a hole through the fig wall and soon die, while the females carry the pollen to a new tree to complete the cycle.

During his time at Edinburgh, Professor Berg focused on identifying some of the fig specimens in the herbarium collection.

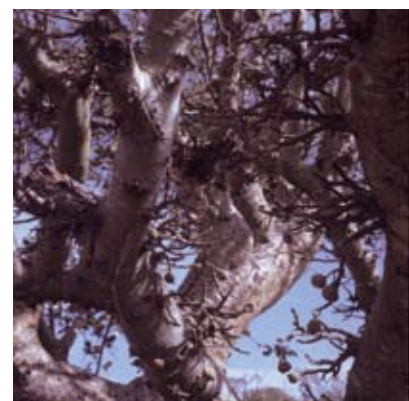
“It’s a continuation of my work in Leiden, but I have also encountered

some new species here,” he says.

“Very few people can accurately identify figs, it’s difficult and time-consuming and so there is an increasing amount of unidentified material.

“People don’t realise how much taxonomic work still needs to be done. Research funding goes to modern techniques such as DNA work, but the people doing that work also need names for specimens. If I retire, there is no one who could continue this work with taxonomic knowledge on the same scale.” ■

For further information, see www.synthesys.info. The deadline for the next call for applications is Friday 17 March 2006.





Left: Women in traditional Lissu costume in Fugong market. Photo: Jin Hyub-Paik.

Below: The jagged ridge of Gaoligong Shan from the Nu Jiang valley, south of Fugong.

Inset: *Rodgersia Pinnata*, a popular woodland garden plant seen here in the forests below the Yaping Pass.

Right: Alpine meadows in the Yaping Pass, on the Burmese border, at 3,600 m. Photo: Jin Hyub-Paik.

David Long reports back on the latest expeditions to this magnificent mountain range.

The Gaoligong Shan is one of the spectacular parallel mountain ranges of western China, rising to 4456m and running for 600km along the Yunnan/Burma border. Since the early 20th century, when George Forrest made the first botanical exploration at the southern end, it has become known as one of the most important biological hotspots in China, but even to this day much of it remains unexplored because of its remoteness and rugged terrain.

The desire to document this diversity fully, and more importantly to safeguard its future, has led Professor Li Heng and her colleagues in the Kunming Institute of Botany (RBGE's 'twin' institute), to muster international help through the Chinese Academy of Sciences, California Academy of Sciences and generous funding from the US National Science Foundation. The background to the project and the first expedition in 2002 were described by Mark Watson and David Knott ('River Deep, Mountain High', *Botanics*, Winter 2002/03). In total seven expeditions have now been mounted, giving us the opportunity to collaborate in a truly remarkable survey of a single

mountain range in greater detail, over several years and in different seasons, than has been possible in Yunnan since Forrest's time.

The overwhelming impression of modern China to the overseas visitor is the pace of development of cities, towns and transport. In 1905 it took George Forrest 23 days to travel 240km from Burma to Yunnan; now we can travel the 400km from Kunming to Dali along the brand-new expressway (the new 'Burma Road') in just four hours. Rapid economic development, with the need for raw materials such as limestone and timber, and the quest to tap the energy of the fast-flowing rivers, brings many dangers to the rich biodiversity of the Yunnan mountains (though, in sharp contrast, other aspects of rural Yunnan have changed little, with traditional village life and small-scale agriculture remaining). Nevertheless, the Gaoligong Shan is now becoming increasingly accessible and, in spite of its protected status, its rich resources make it vulnerable to exploitation, and so documenting its biodiversity is an urgent priority for conservation.

Return to the Gaoligong Shan



George Forrest was based in the trading outpost of Tengchong (then Tengyueh), which lies at the southern end of our study area. Our expeditions to this area have explored the subtropical evergreen forests, rich in oaks, laurels and Theaceae such as *Gordonia longicarpa*, which predominate, though encroached by human disturbance. In the south the project area covers both the east and west flanks of the range (known to Forrest as the Shweli/Salween divide), and northwards the mountains gradually rise higher to over 4000m, where the first truly alpine vegetation appears above the treeline.

From Pianma, just north of Liuku, as far as Gongshan, the ridge crest forms the frontier with Burma, and only the eastern slopes are accessible from a few logging roads. Several peaks top 4000m, but it is at the extreme north of the range that the highest peak is found, Kenichu Pu (or Gomba La) at 4456m. From the Stone Gate on the Nu Jiang (Salween River) north of Gongshan, this peak with its ice and snow looked tantalisingly close in October 2004. In 1916 the Austrian Heinrich Handel-Mazzetti and, in 1922, Frank Kingdon Ward briefly explored this area. In his 1924 book *From China to Hkamti Long*, Ward described his dangerously steep ascent on the 'Path of Terror'. This peak still awaits proper exploration, but, in 2004, we were compensated by access to the remote Dulong Jiang valley, a tributary of the Irrawaddy on the western side of the



Gaoligong Shan across the pass from Gongshan. The Dulong valley, connected by a new but precipitous road, turned out to be of exceptional richness for all kinds of plants. Similarities of the forests to those of east Bhutan were particularly striking with huge columnar trees of *Pinus bhutanica* (not reported previously in the area) and wonderful mossy forests of *Tsuga dumosa*, *Cyclobalanopsis lamellosa* and *Tetracentron sinense*. Many rare bryophytes, some new to Yunnan and China, were collected here.

However, the frustrating inaccessibility of the nearby alpine meadows reinforced our determination to 'get high' and this ambition was fully realised on the most recent expedition in August 2005 when I, with RBGE colleagues Simon Crutchley and Jin Hyub-Paik and botanists and

entomologists from China and the USA, were able to ascend to over 3,700m on two Sino-Burmese passes above Fugong, south of Gongshan. Based in the forestry station of Shibali, surrounded by wonderful mossy evergreen oak forests, we were able to enjoy several days in the alpine meadows and dwarf Rhododendron scrub on the ridge crest. Access was possible to three beautiful mountain lakes, where we enjoyed the superb alpine flora at its best, with a wealth of primulas, gentians, rhododendrons and other alpiners. Back at Shibali we worked late into the night pressing these specimens, a big task as we collected 8 duplicates of each number. The bulging presses were taken by truck down to Fugong each morning where the luxury of electricity allowed efficient drying.

This most recent trip has been the most productive to date, with over 3,000 numbers of vascular plants, and 1,050 numbers of bryophytes. Including the collections from earlier expeditions, we have now made over 16,000 vascular plant and 4,780 bryophyte collections. Handling these collections is a major task, but their distribution to herbaria in China, the USA and RBGE means that they will be available for many research projects on Chinese plants, including the Flora of China, in the future. Many species new to science have been collected, and painstaking research and publication will continue long after the project ends. At least two further expeditions are planned for 2006 including, it is hoped, another chance to sample the wonderful alpine flora which first tempted George Forrest to China. ■



A day in the life



Fay Young meets the Garden's new Events Co-ordinator, Rosie Lewis.

On an autumn morning the sun is flooding into Rosie Lewis's office at the top of Inverleith House through a window offering one of the Garden's best views of Edinburgh's extraordinary skyline, framed by the trees of RBGE.

While people wander through autumn leaves outside, Rosie's work is focused six months ahead as she puts finishing touches to the programme of events from March to August 2006. The list stretches almost bewilderingly from storytelling to science workshops, from organic food to world music, from drama to lectures, from Science Festival to Edinburgh's Fringe. All the time Rosie is checking the big questions – is this event really socially

Clockwise from top left: Rosie Lewis in her office in Inverleith House; children enjoying one of the many events at the Garden during the Science Festival; music is shared at the recent Middle Eastern Magic event. Photo: Eamonn McGoldrick.



inclusive, will it work for young people – against small but essential details – is the room free, what time can people get into the building, when do the gates close, where are the light switches in the glasshouses?

Such is a day's work for RBGE's new Events Co-ordinator, a post made possible by support from The Royal Bank of Scotland. Her task is to encourage a more diverse audience to visit the Botanics, make sure they have a good time and enable them to go away feeling more motivated to look after the environment. Or, as she succinctly sums it up: "More people in, having fun, going away inspired."

Rosie arrived at RBGE in August with a background in arts education, experience of working with young people in the Duke of Edinburgh award scheme, and a spell of voluntary work in the jungle of Ecuador under her belt. "It was a wonderful time to start work here," she says. "The lawn

below my office was full of the sounds of people enjoying the Garden, the Fringe productions were gathering rave reviews and the weather was good, too."

"There is so much creative work going on here throughout the year: art, music and theatre. It is an exciting fusion of science and art." So although there are four clear strands to the Events programme – Real Life Science (RBGE's programme of communicating science to the public); culture and arts; festivals; and events connected to exhibitions – Rosie is careful not to make a dividing line between science and cultural or arts events. "Science is culture," she says simply. For the first few months Rosie has been concentrating on getting to know RBGE. Working closely with the exhibitions team and the Garden's Volunteer Co-ordinator, she is planning a programme that includes regular events for adults as well as children's activities to complement the existing Garden Rangers' programme: "so families with kids can come here knowing there is always something on at the Botanics." Next she will be turning her attention to making links outside as well as inside the Garden. Her ambition for RBGE to reach out to two new communities to RBGE each year is crucial to the Garden's vision of making science relevant to the everyday life of ordinary people. "Whether different youth and ethnic groups, people from local disadvantaged areas or disabled people, we need to make it clear that the Garden is open to everyone."

It's getting dark by the time Rosie leaves for home through the East Gate around 6pm and she makes herself a mental note: "Must buy myself a torch." ■



A creative haven

A new exhibition from American artist Roni Horn continues the tradition of innovation at Inverleith House, as Paul Nesbitt reports.

Inverleith House invites artists to respond to the gallery's architecture, role and location, within one of the world's great botanic gardens. Extending the Garden's international collaboration, artists such as Carl Andre, Melissa Kretschmer, Ed Ruscha, Julian Schnabel and Franz West have all visited Scotland and exhibited here for the first time.

Our approach also encourages artistic development through the production of new work and the creation of original exhibitions, which directly communicate the artist's ideas to an audience able to experience them in stimulating and sympathetic surroundings. Through our exhibitions, the innovation which has been one of the hallmarks of the Garden's long history from 1670 to the present, can also be seen to include the visual arts, as well as science, in its vocabulary.

The annual cycle of exhibitions now runs from April to March, with new exhibitions for spring, summer, autumn and winter periods, utilising where possible the quality of natural light which is one of the most important attributes of Inverleith House. During the next three years, spring exhibitions are planned which will celebrate three

distinct collections of botanical drawings from our archives as part of the Science Festival. Other exhibitions will continue to provide a platform for discovery and learning, allied to an expanding range of educational activities supported by our major external funding partner, The Scottish Arts Council.

This year's winter exhibition, which leads up to the celebration of 20 years of programming at Inverleith House in April, 2006, is of recent work by the acclaimed American artist Roni Horn who is based in New York and Iceland. It also follows the Gallery's policy of inviting artists to respond directly to the space. Working across the fields of photography and sculpture, Roni Horn's photographic imagery is primarily concerned with difference between object, image and identity and ultimately the way in which we, as humans, perceive the world around us. It is paired with another exhibition of the artist's work running concurrently at Museion in northern Italy, as a collaboration between both institutions prompted by the artist on the occasion of this, her first solo exhibition in Scotland. ■



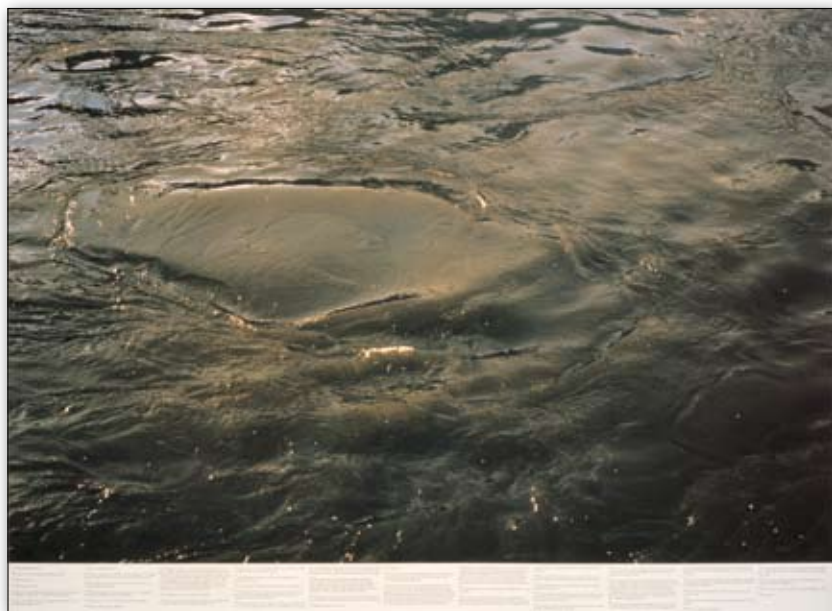
Feltmakers on the map

If you thought you knew felt, come and see how the wool was pulled over your eyes at *On the Map*, an eclectic mix of contemporary felt-works from 12 different countries – and featuring 40 breeds of sheep – on show at Inverleith Garden until January 22.

Central to the exhibition is a magnificently colourful yurt, a tent-like space of Mongolian origin without the poles or ropes, which will be used throughout the festive period to host a variety of story-telling sessions and play an integral part, generally, in the Garden's Green Christmas family events (see page 16 for details). Other items on display range from boots and jackets to wall-hangings, handbags and jewellery. ■

Above: A pair of young visitors discover the world of felt at the current feltmakers' exhibition. Photo: Courtesy of The Herald & Evening Times picture archive.

Left: Roni Horn, 'Still Water (The River Thames, for Example)', 1997-1999, detail from an installation of 15 footnoted photographs printed on uncoated paper, 30 1/2 x 41 1/2 inches each. Courtesy of the artist and Hauser and Wirth, Zurich.



Gifts to the Garden

The Royal Botanic Garden Edinburgh welcomes grants and donations to help continue its commitment to plant conservation, educational programmes and scientific research in 40 countries worldwide, and also to provide all visitors to its four Gardens a unique experience. Here's a round-up of recent gifts.

- Legacies provide an important and growing source of support for the Garden. Supporters have gifted almost £40,000 in legacies this year. A number of our visitors have chosen to make their donations during their lifetime so we can benefit from Gift Aid – a scheme that allows a further 28% of the donation to be claimed from the Government. This includes a recent donation of £10,000 made for the benefit of the library.
- This year's Patrons' Annual Dinner was a particularly stunning event, thanks to the support of NetJets, the principal sponsor, the Howard Hotel and Tower Event Solutions.
- A consortium of 10 laboratories around the world, including RBGE, was awarded a total of \$800,000 US dollars to identify a standard region for DNA barcoding in plants. The funders were the AP Sloan and the Gordon and Betty Moore Foundations.
- A grant of £6,575 from the Darwin Initiative will enable Daniela Weber from Chile to work with RBGE's International Conifer Conservation Programme for six months as a 'Darwin Scholar'. Daniela will work with staff at Edinburgh, Benmore and Logan Botanic Gardens. The main focus of her scholarship will be to develop the Benefit Sharing Agreement for the commercialisation of the Chilean native species within the UK horticultural market.
- The Bromley Trust has pledged an initial £10,000 towards the establishment of a Conservation Monitoring Centre as part of the International Conifer Conservation Programme's collaborative work in Chile. The Centre will help to ensure the long-term survival of threatened species by encouraging local communities and land owners to play an active role in the management of local areas, underpinned by expert training.
- The Dulverton Trust has supported a programme of Community Education at the Garden, aiming to broaden the scope and appeal of our events and engaging new, under-represented audiences through innovative and accessible educational resources, literature and activities. ■

If you would like to help us secure the Garden's future by becoming a member, leaving a legacy or making a donation, please contact Becky Govier at the Development Office on 0131 248 2866 or email b.govier@rbge.org.uk



Lady Susanna Walton with RBGE's Patricia Blackmore at the Annual Dinner.

A night of lights and stars

"The Best party in town" was just one of the many appreciative comments received from Patrons following this year's Annual Dinner.

Lady Susanna Walton, the evening's guest speaker, was heralded "a star" at the Garden's most popular Patrons' Dinner to date. Susanna, with her late husband the British Composer Sir William Walton, created *La Mortella* on the island of Ischia, voted the best garden in Italy in 2004. Hearing how *La Mortella* became a reality was as entertaining and colourful as Lady Walton's flamboyant character.

The evening would not have been possible without sponsorship by Netjets and support from The Howard Hotel

and Tower Event Solutions. Tower's theatrical lighting of the palm house, glasshouses and walk ways through the Botanics made a spectacular finale to a unique evening. ■

If you are interested in knowing more about the Patrons Programme of the National Botanic Gardens of Scotland please contact Becky Govier on 0131 248 2866 or email b.govier@rbge.org.uk

Visit Vancouver!

Visitors to Vancouver are invited to stroll through forests of Himalayan magnolia and rhododendrons, admire alpine habitats from the Andes to the Canaries and enjoy displays of native Canadian plants and Canadian plant introductions.

Under a reciprocal agreement with the University of British Columbia Botanical Garden, NBGS Members can enjoy free entry to this 'hidden gem' among Vancouver's tourist attractions. Vancouver's maritime climate ensures plants are of interest throughout the year.

As well as renowned Asian and Alpine Gardens, UBC Botanical Garden boasts the nearby Nitobe Memorial Garden, one of the top five Japanese gardens outside Japan. Another favourite with local visitors is the Food



Descaisnea insignis at UBC Botanic Garden.

Garden, which showcases established and experimental varieties of vegetables, berries and fruit trees. ■

Reciprocal free entry to other botanic gardens is just one of the many benefits Members enjoy. For more information, please contact the Membership office on 0131 552 5339 or email members@rbge.org.uk

Flying the flag for the Botanics

Beechgrove Garden presenter Carole Baxter tells Anna Levin about her long-standing connection with RBGE.

It was love at first sight when Carole Baxter first visited Benmore Botanic Garden, long before she became a garden TV presenter, or even a gardener.

"I thought it was absolutely beautiful, and it's still one of my favourite gardens," she says. "It was my first trip to Benmore back in the 1970s. Straight away I was struck by the stunning giant redwoods and the walled garden with the backdrop of mountain scenery. I enjoyed the wildness of the Garden and the excitement of discovering the fernery."

Carole was at university studying geography at the time, but after graduating she retrained in Amenity Horticulture at Elmwood College in Fife.

"I knew I never wanted to be stuck in an office and I chose to be a professional gardener for the pure love of working outdoors. I find plants absolutely fascinating and enjoy studying them."

It was a career path which led her to her current role as presenter of BBC Scotland's Beechgrove Garden. The job brought her closer to RBGE when the Gardens were featured on Beechgrove Garden – notably Alan Bennell waxing lyrical on a fungal foray at Benmore and a programme on community gardens with Logan curator Barry Unwin.

"It's such a huge contrast going from the wild atmosphere and rhododendrons of Benmore to the exotic, tropical feel of Logan," she says. "I'm always amazed by the plants you can grow there. Travelling around so many gardens with my work, I'm always astounded by what can be grown in Scotland. I've learnt never to say it can never be grown – someone will always phone in and tell me they are growing it!"



With such enthusiasm for the work of RBGE, she was delighted to have the opportunity to "fly the flag for the garden" as an RBGE Trustee.

"I especially enjoyed meeting the staff and learning more about the Garden's work," she says. "Many people who come here aren't aware of the extent of the education and conservation work around the world."

Now that her eight-year term as a Trustee has ended, Carole plans to continue her support by leaving a legacy to the Garden.

"I chose RBGE not just because I love the Gardens and the beauty of the plantings, but because of the conservation work that the organisation does – how would we survive without plants? To me, leaving a legacy to the Garden is a way of promoting the importance of plants". ■

If you would like your free guide on how to make a will, please telephone Becky Govier on 0131 248 2866 or email b.govier@rbge.org.uk

Could your garden grow some of Britain's endangered plants, asks Pete Brownless.

The chances are that you regard any native plants in your garden as weeds rather than the subject of conservation concern. Yet the UK is home to many plants that are endangered because their wild habitats are under threat, and some of these are easy to cultivate.

For the alpine enthusiast, the Scottish primrose *Primula scotica* from the north coast of Scotland is a perfect miniature. It would be happy in a trough with the stunning blue flowers of Alpine gentian *Gentiana verna* and purple saxifrage *Saxifraga oppositifolia*.

An area of rough grass can be transformed by the addition of some native plants, which will also encourage wildlife into your garden. Yellow rattle *Rhinanthus minor*, a semi-parasite whose roots tap into the grass roots for added nutrition, is a challenge but will reward you with elegant spikes of yellow flowers from May to September.

In a woodland situation or lightly shaded herbaceous border, try herb paris *Paris quadrifolia*, a close relative of the trilliums from North America. If you have room for a tree, perhaps the best value is the common rowan *Sorbus aucuparia*. Flowers, berries, vibrant autumnal colours and attractive to wildlife – it has it all!

At the Gardens, all plant labels indicate the plants' distribution, so look out for those from the UK and check out the native plant trails at all four Gardens. ■

Below: The Scottish primrose *Primula Scotica* from *Sowerby's English Botany* (Supplement 1).



National Botanic Gardens
of Scotland comprise:



Royal Botanic Garden Edinburgh

Open daily (except 25 December and 1 January)

Inverleith Row, Edinburgh, EH3 5LR

Tel: 0131 552 7171 • Email: info@rbge.org.uk



Benmore Botanic Garden

Open daily, 1 March to 31 October

Dunoon, Argyll, PA23 8QU

Tel: 01369 706261 • Email: benmore@rbge.org.uk



Logan Botanic Garden

Open daily, 1 March to 31 October

Port Logan, Wigtownshire, DG9 9ND

Tel: 01776 860231 • Email: logan@rbge.org.uk



Dawyck Botanic Garden

Open daily, 1 February to 30 November

Stobo, Peeblesshire, EH45 9JU

Tel: 01721 760254 • Email: dawyck@rbge.org.uk

For further information about events at the Garden,
Education Courses and Membership, see our website

www.rbge.org.uk

For an events programme, contact Ellie Cooper on
0131 248 2991, email: e.cooper@rbge.org.uk

Celebrate *Green Christmas* at the Botanics!



*Escape the hustle and bustle of
the high street and discover a magical
Green Christmas at the Botanics.*

**Join us every weekend until the
18th December for a host of festive activities
for the whole family.**

- Meet Green Santa and his reindeers • Make your own Christmas decorations •
- Hear cosy stories inside a magical felt yurt • Enjoy 'Seasonal Spices' guided walks •
- Get creative in craft and art workshops for adults •

For more information call 0131 248 2937 or visit www.rbge.org.uk