INTRODUCTION

The fourth World Botanic Gardens Congress was held in Dublin from 13 to 18 June, and the conference organisers, both from the National Botanic Garden, Glasnevin and from Botanic Gardens Conservation International (BGCI), should take great pride in what was a well-organised and upbeat conference packed with lectures, keynote speeches, demonstrations and special symposia. With the subtitle 'Addressing global change – a new agenda for botanic gardens', it was full of positive messages for conservation and the role of botanic gardens in safeguarding plant diversity at this most critical of times. A few of the major themes included the global role of botanic gardens in restoration, a consideration of the implications of climate change for tree conservation and the role of art in the garden and the ways in which botanic gardens can help address the Millennium Development Goals.

There can be no more widely known figure in the world of botanic gardens than Professor Sir Ghillean Prance, and the editors are delighted that he agreed to accept the offer of writing the *Sibbaldia* Guest Essay. Sir Ghillean has held senior posts in New York Botanical Garden, the Royal Botanic Gardens, Kew (RBG Kew), the Eden Project and the National Tropical Botanical Garden, Hawaii (NTBG) and is therefore ideally placed to provide a succinct and authoritative overview of the events leading up to the International Year of Biodiversity. In his essay he looks back to the origins of plant conservation in botanic gardens, the emergence of biodiversity as a concept, the establishment of the Convention on Biological Diversity (CBD), the purpose of the International Year of Biodiversity and the vital role that botanic gardens have been playing in promoting it.

James Clugston is a student at the Royal Botanic Garden Edinburgh (RBGE) and a cycad enthusiast. When it came to choosing the topic for his major dissertation there was only one subject area that was a serious contender – cycads. James chose to undertake a major review of the cycads in the Living Collection at RBGE, which included checking their location, nomenclature and cultivation. He made herbarium specimens from the material, took photographs and stored them on the database, and made recommendations for better display and cultivation. His enthusiasm and dedication to the task were well received by RBGE's glasshouse staff, who subsequently adopted his recommendations. It has been particularly rewarding to observe how dedicated students such as James can make a real contribution to the work of botanic gardens.

Sibbaldia was established to champion and provide an outlet for botanic garden horticulture in all its guises from cultivation, conservation and plant records to legislation, quarantine and management. The editors have been particularly determined, however, to encourage garden staff to commit to writing their knowledge and experiences of plants and their cultivation, especially where this concerns threatened species. To this end we have set a goal to ensure that each issue will have at least two papers dedicated to this topic. We are particularly pleased, then, that this issue carries four papers covering plants and their cultivation. Michael De Motta from the NTBG starts his

paper with a brief history of the plants of Hawaii before describing the arrival of exotic invasive species and their effect on the native vegetation. He then selects eight threatened species and describes their propagation and cultivation. Tony Conlon from RBGE is responsible for cultivating the research collections of *Rhododendron* section Vireya. Since taking responsibility for the collection he has been aware of a few other ericaceous species in the glasshouse and decided to investigate one genus, *Diplycosia*, further. The result of his endeavours is a fascinating insight into this little-known genus in which he covers their history, literature, identification and habitat, and then reviews the collection at Edinburgh including their cultivation and display. Carlos Magdalena, from RBG Kew, on the other hand, has chosen just one species – *Ramosmania rodriguesii* from the island of Rodrigues. It is a fascinating story of almost complete despair that has a happy ending, and it shows just what staff in botanic gardens are capable of, given determination and enthusiasm. Christopher Grey-Wilson's paper reads almost like a detective story. In his paper '*Meconopsis grandis* – the true Himalayan blue poppy' he unravels the complicated history of the collection, identification and cultivation of this charismatic (but confusing!) species and publishes two new subspecies. John Mitchell concludes the paper with a section on cultivation.

Sibbaldia might seem a strange place in which to publish a paper on the outcomes of management research yet this is precisely the topic of the seventh paper. For many years Alasdair Macnab, Director of Corporate Services at RBGE, has been very keen to move away from the traditional cost centre or departmental approach to budgeting at RBGE and towards a system that looks at the cost of providing a service or completing a project, irrespective of how many individuals of departments contribute to that service or project. His theory is that such an approach would improve focus and research output at botanic gardens and make for the more efficient use of resources. Using the Balanced Scorecard and a web-based system for recording time and resources spent on outputs Alasdair, Professor Chris Carr and Professor Falconer Mitchell describe how botanic gardens could be far more efficient in their management of resources, activities and outputs. Mercy Morris and colleagues also present a management paper, but on a new, more analytical and objective approach to prioritisation for the conservation of cultivated plants. Their paper describes why cultivated plants should be conserved, the mechanisms of plant loss, detecting extinctions in cultivated plants and cultivated plant conservation in the UK. In the knowledge that not all cultivated plants are threatened and even if they were, they could not all be conserved, they then present methods for setting criteria for prioritisation and an assessment methodology. The paper concludes with tables showing proposed actions for different categories of threat and how rarity can be evaluated.

The size and diversity of any botanic garden's living collection, especially those that focus on wild source material, is only as good as their staff's ability to collect material and bring it safely into the collection. The skills required for this are usually learnt directly from experienced collectors on expeditions but are often assumed to be known. While gaining knowledge from first-hand experience is undoubtedly the best method, written sources of information are also important and allow knowledge to be spread

more widely. However, there are very few manuals or written sources of practical information, and so the paper by Sadie Barber and Andrew Ensoll is particularly welcome. Both are experienced horticulturists but have been on relatively few expeditions and so, following their recent trip to Papua, Indonesia, which was undertaken in conjunction with more experienced botanists and horticulturists, they decided to write down the hands-on practical fine detail of exactly how they collected and maintained living material in the field before bringing it back to Edinburgh.

Food production for animals in zoos might not appear to be a logical topic for a journal covering botanic garden horticulture, but Kevin Frediani from Paignton Zoo argues that demonstrating high-intensity urban food production in places like zoos and botanic gardens is absolutely valid. Using an innovative multi-storey and high-density hydroponic system has given Kevin the ability to produce an astonishing amount of salad crops in a relatively small space. Not only is he supplying food for animals but his system creates the opportunity for interpretation boards covering topics such as food sources, food miles, urban agriculture, food security and local supply – topics that are increasingly important for botanic gardens.

Geoffrey Harper is one of *Sibbaldia*'s most regular contributors, and his fascination with phenology and the value of botanic gardens in being highly suitable places in which phenological studies can be undertaken is apparent through his series of papers. In his latest contribution, 'Lessons from phenology: an interim report', he presents preliminary findings on 20 provisional multiple-regression models based on a small data set to account for the timing of first-flower date and other phenological events. He further suggests biological mechanisms to explain the pattern of temperature-dependent developmental stages and discusses how plants and animals are likely to react to climate change. He fully appreciates the need for many more years of observations before any statistically valid conclusions can be drawn, but, nevertheless, this interim report makes for interesting reading.

The need for skilled horticulturists in botanic gardens worldwide has never been more urgent, yet there is a lack not only of suitably qualified staff but also of training centres. Based on his experience in many parts of the world including Oman, Turkey and Soqotra, coupled with the knowledge of how underwater diving is taught internationally, Leigh Morris has devised a practical and innovative method for teaching horticulture which is applicable to all situations, all around the world. The Certificate in Practical Horticulture has been devised by Leigh at RBGE but is now endorsed by BGCI and the Eden Project and is currently being further developed and refined. In their paper Leigh and Laura Cohen describe the background to the course and its development.

This issue concludes with two Short Notes, one on the importance of good roots and the development and use of Air-Pots™ and the other a historic account of *Gladiolus wilsonii* which has interesting links with the botanic gardens at both Edinburgh and St Andrews.

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