

# roots

## BOTANIC GARDENS

### Education for Sustainability

- Decade of Education for Sustainable Development
- Green Legacy - Travelling Exhibition
- Anarchy or Order?
- Jewels of the Caribbean
- Protean Visions and Plastic Dreams

MOUNDS  
WALLS  
TUNNELS  
BAMBOO GROVES

Botanic  
Gardens

Conservation

International

Education

Review

July 2003

Planting for  
Education

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# Planting for Education

## ■ Editorial

The practise of planting for education in botanic gardens may be traced back to the very first European gardens when order beds were established specifically for the study of medicinal plants and taxonomy. Turn the clock forward to present day and gardens around the world continue to maintain order beds using them as important teaching resources for students of horticulture and botany.

In recent times, however, the roles of botanic gardens have changed. And in response to the environmental crisis, they are acutely aware of the role education can play. The teaching of biodiversity conservation and education for sustainability is complex. Not only does it involve people learning about the importance of plants and habitats, it also engages them in a critical and creative examination of the issues surrounding biodiversity loss: what factors are causing the loss, how can it be halted and reversed and what exactly is their role in this process. This type of education demands a more holistic approach to education than botanic gardens have hitherto offered. It also requires gardens to provide environments for learning. In this issue of Roots we argue that for botanic gardens to fully realise their potential for biodiversity conservation, they need to re-examine and address their planting policies to support their educational aims.

At the heart of this is the need for interdepartmental communication, in particular between horticulture and education. Glasshouse Supervisor, Robert Brett, of Cambridge University Botanic Garden, UK, writes from personal experience about how his collaboration with education staff has led to a more integrated educational approach. He also presents the key points of a discussion group on Planting

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Les pratiques de plantation pour l'enseignement dans les jardins botaniques remontent aux tout premiers jardins botaniques en Europe où les parterres systématiques étaient conçus spécialement pour l'étude des plantes médicinales et la taxonomie. De nos jours les jardins botaniques dans le monde entier continuent d'entretenir des parterres systématiques et les utilisent comme des supports d'enseignement importants pour les étudiants en botanique et en horticulture. Néanmoins, ces derniers temps le rôle des jardins botaniques a évolué. En réponse à la crise environnementale, ils ont une conscience aiguë du rôle qu'ils peuvent jouer en matière d'éducation. L'enseignement de la conservation de la biodiversité et l'éducation au développement durable sont complexes. Ça n'implique pas seulement l'apprentissage du rôle des végétaux et de leurs habitats, mais également une étude examinant de façon critique et créative les problèmes de la perte de la biodiversité. Quels sont les facteurs en cause, comment arrêter et renverser le phénomène, et quel est exactement leur rôle dans ce processus. Ce type d'éducation demande une approche plus globale que celle que les jardins botaniques ont proposé jusque là. Cela implique également que les jardins offrent un environnement pour l'enseignement. Dans ce numéro de Roots, nous montrons que si les jardins botaniques veulent remplir pleinement leur rôle pour la conservation de la biodiversité, alors ils doivent réexaminer et orienter leurs politiques de plantation pour servir leurs objectifs pédagogiques.

Pour cela une communication entre les services est capitale, en particulier entre l'horticulture et l'éducation. Robert Brett directeur des serres du Jardin Botanique de l'Université de

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La costumbre de plantar para educar en jardines botánicos tiene sus raíces en los primeros jardines botánicos europeos, cuando se estabilizaron prados ordenadas específicamente para los estudios de plantas medicinales y taxonómicas. Volviendo a hoy en día vemos que los jardines alrededor del mundo continúan con manteniendo prados ordenadas como recursos importantes para enseñar a estudiantes de horticultura y de botánica.

No obstante, en los últimos años el papel de los jardines botánicos ha cambiado. Si bien para responder a la crisis ambiental estos se han vuelto plenamente concientes de la tarea de concientizar. La enseñanza de la conservación de la biodiversidad, y la educación para sustentabilidad son temas complejos. No se trata solamente de aprender la importancia de las plantas y sus hábitats, sino también de iniciar un examen crítico y creativo de los asuntos de la pérdida de la misma; cuales son los factores causativos, como detener e invertir a los mismos, cual es el papel concreto de ellos en este proceso. Esta forma de concientizar exige un enfoque más holístico en la educación que los jardines botánicos han estado ofreciendo hasta ahora. Los jardines necesitan proporcionar ambientes para aprender. Este número de Roots aboga porque los jardines botánicos tengan que revisar e implementar su política de plantar para apoyar sus metas de concientizar para realizar su potencial de conservar la biodiversidad.

El punto clave en eso es la comunicación interdepartamental, en especial entre la horticultura y la educación. Robert Brett, Supervisor de Invernaderos del Jardín Botánico de la Universidad de Cambridge, UK, escribe acerca de su experiencia de buena colaboración con el personal de

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for Education held during the 5th International Congress on Education in Botanic Gardens in Sydney last year.

Two articles illustrate that, when the whole garden is committed to planting for education, exciting outcomes are possible. At the Eden Project, Cornwall, UK, there is no question that education is a separate activity. Catherine Cutler explains how the whole garden has been landscaped and planted with education in mind to convey the critical interdependence humankind has on plants. Carolann Baldyga of the Fairchild Tropical Garden, Florida, USA, describes a magnificent exhibition in the process of development. Jewels of the Caribbean will feature six habitats and will provide visitors with information that links the people and plants of South Florida to family and botanical roots in the Caribbean. Extensive planning and collaboration between staff and community has been necessary for the setting up of this exhibition, designed to promote positive attitudes and actions towards the threatened ecosystems of the Caribbean region.

If we accept the argument that most botanic gardens have been designed with adults in mind, then it follows that we are very likely to be missing opportunities to attract and inspire younger audiences. Roger Hart, Co-Director of the Environments Research Group, New York, in his article 'Anarchy or Order? Some Dilemmas in Designing Landscapes for Young Children in Botanical Gardens' urges gardens, to be inclusive of younger audiences by taking into consideration the way in which they use the physical environment. His informed views offer strategies for better planning and designing within gardens for these adults of the future. The article by Tres Fromme, a Planning and Design Specialist at Longwood Gardens, USA, also offers some thought provoking principles to guide the development of a new garden specifically for children.

Still focusing on children's gardens, we take a look at one of the most venerable children's gardens in the world, located in the Brooklyn Botanic Garden, USA.

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Cambridge, UK, décrit son expérience personnelle où la collaboration avec l'équipe éducation a conduit à une approche de l'éducation plus intégrée. Il présente également les points clés dégagés par le groupe de discussion « Planter pour l'éducation » qui a eu lieu l'an dernier à Sidney lors du 5<sup>ème</sup> Congrès International sur l'Education dans les Jardins Botaniques.

Deux articles illustrent le fait que lorsque tout le jardin s'engage à planter pour l'éducation, des résultats très intéressants sont possibles. Dans le Projet Eden, Cornouailles, UK, il est indéniable que l'activité éducative existe à part entière. Catherine Cutler explique comment tout le jardin a été dessiné et planté avec, en tête, son rôle éducatif pour faire comprendre l'interdépendance critique qui existe entre l'homme et les plantes. Carolann Baldyga du « Fairchild Tropical Garden », Floride USA, décrit une magnifique exposition en cours de développement. « Joyaux des Caraïbes » va mettre en scène six habitats et donner aux visiteurs des informations reliant les gens et les plantes du Sud de la Floride avec leurs origines familiales et botaniques dans les Caraïbes. Des programmes de collaboration importants entre les professionnels et la population ont été nécessaires pour la mise en place de cette exposition, conçue pour promouvoir des actions et des comportements positifs vis à vis des écosystèmes menacés dans la région des Caraïbes.

Si l'on accepte l'argument que la plupart des jardins botaniques ont été conçus pour les adultes, alors il apparaît qu'on manque l'opportunité d'attirer et d'inspirer un public plus jeune. Dans son article « Faire des plans et concevoir du point de vue des enfants » Roger Hart, co-directeur de la groupe de la recherche sur l'environnement, New-York, nous encourage à prendre en considération la façon dont les enfants utilisent leur environnement physique. Sa vision informée offre des stratégies pour mieux dessiner et concevoir les jardins pour ces adultes du futur. L'article de Tres Fromme, un paysagiste spécialisé

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educación que ha conducido a un enfoque más integrado de concientizar. Él presenta los puntos claves de un grupo de consulta sobre el tema Plantar para Concientizar, llevado a cabo el año pasado en Sydney durante el 5<sup>º</sup> Congreso Internacional sobre Educación en Jardines Botánicos.

Dos artículos muestran los resultados fascinantes que son posibles cuando todo el jardín se compromete a plantar para concientizar. En el Proyecto Eden, Cornwall, UK, no cabe duda que concientizar es una actividad integrada. Catherine Cutler explica que todo el jardín fue diseñado y plantado teniendo en cuenta el concientizar en la interdependencia crítica entre la humanidad y las plantas. Carolann Baldyga del Jardín Tropical de Fairchild, Florida, EEUU, describe una exposición magnífica en proceso de desarrollo. 'Las Joyas del Caribe' mostrará seis hábitats y proporcionará a los visitantes información sobre las relaciones entre la gente y las plantas del Sur de Florida y las raíces familiares y botánicas en el Caribe. Para esto es necesaria una colaboración y planificación extensivas entre el personal y la comunidad para llevar a cabo esta exposición que tiene la meta de promover actitudes y acciones positivas para los ecosistemas amenazados en la región caribeña.

Si la práctica establecida es diseñar los jardines botánicos para adultos, entonces es muy probable que se escapen las oportunidades para atraer e inspirar un público más joven. En su artículo 'Planificar y diseñar desde la perspectiva de un niño', Roger Hart, co-director del grupo de investigación del medio ambiente, Nuevo York, insiste que los jardines incluyan tomando en consideración la forma en que utilizarán el ambiente físico con el público más joven. Sus opiniones con cierto fundamento nos ofrecen estrategias para mejor planificar y diseñar desde dentro de los jardines para los adultos del futuro. También el artículo escrito por Tres Fromme, Especialista en Planificar y Diseñar de los Jardines de Longwood, EEUU, ofrece los principios rectores

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Ted Maclin, Director of the garden, believes that a children's' garden can serve as a model of sustainability. It may be used, for example, to teach the principles of sustainable gardening (integrated pest management, composting, organic fertilizers, etc.), while also helping to break down social barriers through interaction among children and adults from different social and cultural backgrounds. His article offers sound advice for anyone wanting to set up a children's garden within a botanic garden.

With energy and vision, planting for education may be taken beyond the garden walls in to the wider community. In this vein, Abel Atiti of the National Museums of Kenya, presents a case study in which a school-based botanic garden was developed. He describes how the site was transformed into a site for critical environmental interpretation and education processes. Idy Wong at the Kadoorie Farm and Botanic Garden, explains how their garden has identified 'learning sites' for students to explore native trees through first hand experience. His view is that learning in the environment illustrates the concepts much better than a thousand words.

With growing numbers of people living in urban environments the likelihood of them experiencing nature first-hand is remote. By planting for education botanic gardens can bridge this experiential gap. We need to move full circle and ensure that planting for education is once again an integral part of our activities.

■ English

▲ French

● Spanish

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au jardin de Longwood, USA, présente également des principes qui prêtent à des réflexions pour le développement d'un nouveau jardin spécifiquement pour les enfants.

Se focalisant encore sur les jardins pour enfants, nous jetons un œil sur l'un des plus vénérables au monde, le Jardin Botanique de Brooklyn, USA. Ted Maclin, Directeur du jardin, pense qu'un jardin pour enfants peut être un modèle de développement durable. Il peut être utilisé pour enseigner les principes du jardinage biologique ( lutte intégrée, compost, fertilisants organiques, ...) tout en aidant à casser les barrières sociales en favorisant les interactions entre enfants et adultes de niveaux sociaux et culturels différents. Cet article donne de précieux conseils pour qui veut monter un jardin pour enfants au sein d'un jardin botanique.

Avec de l'énergie et de la vision, planter pour l'éducation peut être une action qui rayonne au delà des murs du jardin vers un public plus large. Dans cette veine, Abel Atiti du Musée National du Kenya, présente un cas d'étude dans lequel un jardin botanique basé dans une école a été développé. Il décrit comment le site a été transformé en un lieu important d'interprétation et d'éducation à l'environnement. Idy Wong au « Kadoorie Farm and Botanic Garden » explique comment leur jardin a identifié des « sites d'apprentissage » pour que les étudiants y découvrent des arbres indigènes à travers une expérience directe. Son point de vue est que l'enseignement sur le terrain vaut mieux que mille paroles.

Avec l'augmentation du nombre de personnes vivant en zone urbaine, les chances pour elles d'avoir des expériences directes de la nature sont faibles. En plantant pour l'éducation, les jardins botaniques peuvent combler cette lacune. Nous devons faire le point et nous assurer que « planter pour l'éducation » est une partie intégrante de nos activités.

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[y lineamientos] para desarrollar un nuevo jardín específicamente para niños, que hace reflexionar.

Continuando el enfoque en jardines para niños, echamos una mirada a uno de los jardines más reconocidos en el mundo, ubicado en el Jardín Botánico de Brooklyn, EEUU. Ted Maclin, Director del jardín, opina que un jardín para niños puede servir como modelo de sustentabilidad. Puede ser usado, por ejemplo, para enseñar los principios de la jardinería sustentable (manejo integrado de plagas, preparación y utilización de abono, fertilizantes orgánicos, etc.), de esta manera se ayudara romper las barreras sociales para la interacción entre los niños y adultos de diversos estratos sociales y culturales. Su artículo ofrece un consejo sensato a cualquier persona que quiera crear un jardín de niños dentro de un jardín botánico.

Con energía y visión, se puede extender el plantar para concientizar fuera de los muros del jardín hasta la comunidad en general. Siguiendo esta vena, Abel Atiti de los Museos Nacionales de Kenya, presenta un estudio monografía del desarrollo de un jardín botánico en una escuela. Él describe la transformación de un sitio apto para las interpretaciones críticas del ambiente y para los procesos de concientizar. Idy Wong de la Granja y Jardín Botánico Kadoorie explica como se han identificado 'sitios de aprendizaje' dentro del jardín para que los estudiantes exploren arboles nativos por experiencia directa. Él opina que el aprender en el ambiente mismo ilustra los conceptos mejor que mil palabras.

Con el creciente número gente que vive en ambientes urbanos, es remota la probabilidad de que se tenga experiencia directa en la naturaleza. Los jardines botánicos pueden salvar esta brecha en su experiencia por el plantar para concientizar. Debemos completar el círculo para asegurar que el plantar para concientizar siga siendo parte integral en nuestras actividades.

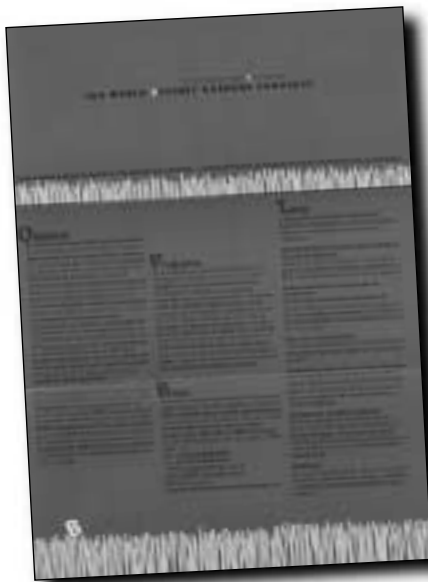
# Nouvelles

# Noticias

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# up date

## ■ News



### 2nd World Botanic Gardens Congress

The 2nd World Botanic Gardens Congress will take place in Barcelona, Spain, during April 2004. The primary goal of the World Congress is to provide a forum for botanic gardens to consider matters of mutual importance and concern. In particular, the congress will review the implementation of the International Agenda for Botanic Gardens in Conservation. Education and Sustainability is one of the six themes of the congress and educators are invited to send in their proposals for inclusion in the congress programme. A first circular for the congress has been sent to all BGCI members. For further information contact the Barcelona web site: [www.bcn.es/medciencias/botanicgardens2004](http://www.bcn.es/medciencias/botanicgardens2004) and BGCI's web site: [www.bgci.org](http://www.bgci.org)

## ▲ Nouvelles

### Deuxième Congrès Mondial des Jardins Botaniques

Le deuxième Congrès Mondial des Jardins Botaniques se tiendra à Barcelone, Espagne, en avril 2004. L'objectif principal du congrès mondial est d'être un lieu d'échange sur toutes les affaires d'importance et d'intérêt commun aux jardins botaniques. En particulier, le congrès fera le point sur la mise en place de l'agenda international pour 'la Conservation dans les Jardins Botaniques'. 'L'éducation et le développement durable' sera l'un des six thèmes du congrès. Les éducateurs sont invités à envoyer leurs propositions qui pourront être intégrées au programme du congrès. Une première circulaire a été envoyée aux membres du BGCI. Pour plus d'informations, visitez le site Internet de Barcelone : [www.bcn.es/medciencias/botanicgardens2004](http://www.bcn.es/medciencias/botanicgardens2004) et le site du BGCI : [www.bgci.org](http://www.bgci.org)

### Un œil Sur la Toile

N'hésitez pas à étudier attentivement le site Internet du BGCI qui change constamment, en particulier pour vérifier si les informations sur votre jardin ou organisation sont correctes et complètes. Vous pouvez trouver le site à l'adresse [www.bgci.org.uk](http://www.bgci.org.uk). Tout commentaire, ajout ou proposition seront les bienvenus auprès de l'éditeur Internet du BGCI Jamie O'Connell : [jamie\\_oconnell@bgci.org.uk](mailto:jamie_oconnell@bgci.org.uk)

### La Décennie de l'Éducation pour le Développement Durable

Le projet de résolution sur la Décennie de l'Éducation pour le Développement Durable des Nations Unies a été adopté par l'Assemblée Générale des

## ● Noticias

### 2º Congreso Mundial de Jardines Botánicos

El 2º Congreso Mundial de Jardines Botánicos tendrá lugar en Barcelona, España, en abril del 2004. El objetivo principal del Congreso es ofrecer un foro de intercambio y discusión para los jardines botánicos en aspectos de mutuo interés y preocupación. En particular, el Congreso revisará la implementación de la Agenda Internacional de Conservación en Jardines Botánicos. Educación y Sustentabilidad es uno de los seis temas del Congreso, por lo que invitamos a los educadores a enviar trabajos para incluirlos en el programa. Se ha enviado la primera circular del Congreso a todos los miembros de BGCI. Para más información visita el sitio [www.bcn.es/medciencias/botanicgardens2004](http://www.bcn.es/medciencias/botanicgardens2004), y en el sitio de BGCI [www.bgci.org.uk](http://www.bgci.org.uk)

### Visita el Internet

Te invitamos a revisar al dinámico portal de BGCI, y revisar especialmente que los datos de tu jardín y de tu institución estén correctos y completos. Puede centrarse en [www.bgci.org.uk](http://www.bgci.org.uk). Correcciones, adiciones, comentarios y sugerencias son gratamente recibidos por el Editor del portal de BGCI, Jaime O'Connell en [jamieoconnell@bgci.org.uk](mailto:jamieoconnell@bgci.org.uk)

### Década de la Educación para Desarrollo Sustentable

La resolución preliminar de las Naciones Unidas sobre la Década de la Educación para el Desarrollo Sustentable se adoptó en la Asamblea General de las Naciones Unidas, en diciembre del 2002. La

Left: Flyer for the 2nd World Botanic Gardens Congress to be held in Barcelona, Spain

## ■ News

### Web Watch

Please take a close look at the ever-evolving BGCI web site and, in particular, check to see if details about your garden or organisation are correct and complete. It can be found at [www.bgci.org.uk](http://www.bgci.org.uk). Amendments, additions, comments and suggestions will be gratefully received by BGCI's Web Editor, Jamie O'Connell at [jamie\\_oconnell@bgci.org.uk](mailto:jamie_oconnell@bgci.org.uk)

### Decade of Education for Sustainable Development

The Draft Resolution on the United Nations Decade of Education for Sustainable Development was adopted at the United Nations General Assembly, in December 2002. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has been designated as the lead agency for the promotion of the Decade of Education for Sustainable Development. In consultation with other relevant international organisations, governments, non-governmental organisations and other stakeholders, UNESCO will provide guidance for governments to incorporate concrete measures to promote education for sustainable development in their respective national educational plans.

### Canada

#### Green Legacy

Green Legacy is the title of a travelling exhibition that explores the beauty, diversity and vulnerability of Canada's native plants and plantscapes. It presents the importance of plants, what threatens them, who works to protect them, and what the general public can do to help conserve them. The 150 m<sup>2</sup> exhibit includes interpretive units and panels, herbarium specimens, interactive computers, video, hands-on components and activity-based programming materials.

Green Legacy opened at the Canadian Museum of Nature in Ottawa on May 9, 2002 and has just begun its cross-Canada tour. Museums, botanical gardens, and other venues hosting the exhibit are encouraged to partner with other groups to present

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Nations Unies en décembre 2002.

L'Organisation des Nations Unies pour l'Éducation, la Science et la Culture (UNESCO) a été désignée comme la principale agence pour la promotion de cette décennie. En collaboration avec d'autres organisations internationales, des gouvernements, des organisations non-gouvernementales et d'autres acteurs, l'UNESCO fournira aux gouvernements des lignes directrices pour mettre en place des mesures concrètes de promotion pour l'éducation au développement durable dans les programmes d'éducation.

### Canada

#### Héritage Vert

Héritage Vert est le titre d'une fascinante exposition itinérante qui explore la beauté, la diversité et la fragilité des plantes indigènes et des paysages végétaux du Canada. Elle présente l'importance des plantes, les menaces qui pèsent sur elles, ceux qui travaillent pour les protéger et ce que le grand public peut faire à cet égard. Les 150m<sup>2</sup> de l'exposition comprennent des panneaux et éléments d'interprétation, des échantillons d'herbier, des éléments touche à tout, des activités interactives sur ordinateur, des vidéos, des manuels, et des documents sur des activités d'accompagnement.

Héritage Vert a été inauguré au musée canadien de la nature de Ottawa le 9 mai 2002 et vient d'entamer un tour du Canada. Les musées, jardins botaniques et autres lieux qui accueilleront l'exposition sont encouragés à s'associer avec d'autres associations complémentaires au niveau local. Ceci permet de donner aux messages pédagogiques de l'exposition un contexte local et de promouvoir les actions locales de conservation des plantes. L'exposition a été conçue par le musée canadien de la nature de Ottawa et le jardin botanique royal de Hamilton, en collaboration avec d'autres jardins botaniques canadiens. Le département du patrimoine canadien, le programme d'assistance aux musées et la fondation W. Garfield Weston ont financé le projet. Pour plus d'informations, contactez :

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Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO) ha sido designada como la agencia promotora de la Década de la Educación para el Desarrollo Sustentable. En colaboración con otras organizaciones internacionales destacadas, gubernamentales y no gubernamentales y otras, la UNESCO guiará a los gobiernos para incorporar medidas concretas para promover la educación para el desarrollo sustentable en sus respectivos planes oficiales de educación.

### Canadá

#### Herencia Verde

Herencia verde es el título de una fascinante exhibición itinerante que explora la belleza, diversidad y vulnerabilidad de las plantas nativas y paisajes de Canadá. Muestra la importancia de las plantas, qué las amenaza, qué se está haciendo para protegerlas y qué puede hacer el público para ayudar a su conservación. La exhibición de 150m<sup>2</sup> incluye rótulos y unidades interpretativas, especímenes de herbario, computadoras interactivas, video y materiales para programar actividades prácticas.

La exhibición Herencia Verde se inauguró en el Museo de la Naturaleza Canadiense en Ottawa, el 9 de mayo del 2002, y recién empezó su gira a través de Canadá. Museos, jardines botánicos y otros organismos que reciben la exhibición son invitadas a colaborar con otros grupos de la comunidad para llevar a cabo talleres relacionados a la muestra. Asegura que los mensajes educativos de la exhibición adopten un contexto más local y promoviendo un esfuerzo para la conservación de las plantas locales. La exhibición fue desarrollada por el Museo Canadiense de la naturaleza de Ottawa y por los Reales Jardines Botánicos de Hamilton, con asesoría de otros jardines botánicos canadienses. El Departamento de Patrimonio Canadiense, el Programa de Asistencia a Museos y la Fundación W. Garfield Weston contribuyeron en el financiamiento del proyecto.

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complementary community workshops. This ensures that the educational messages presented in the exhibit are given a local context and that local plant conservation efforts are promoted. The exhibition was developed by the Canadian Museum of Nature, Ottawa, and Royal Botanical Gardens, Hamilton, in consultation with other Canadian botanical gardens. The Department of Canadian Heritage, Museums Assistance Program and the W. Garfield Weston Foundation provided funding for the project.

For more information contact: Laurel McIvor, Canadian Botanical Gardens Education Co-ordinator, c/o Jardin Botanique de Montréal, 4101, Sherbrooke St. E. Bureau 318, Montréal, Québec H1X 2B2, Canada. Tel: (514) 872-5420 (Montreal), (905) 527-1158 ext. 519 (Hamilton). Fax: (514) 872-3765. Email: lmcivor@rbg.ca. Website: www.rbg.ca/greenlegacy. For booking information: <http://nature.ca/exhibits>

### Chile

#### CD-Rom on Native Plants

The National Botanic Garden of Chile, Viña del Mar, has published a CDROM on the native plants of Chile. Targeted at primary aged students (7-10 years of age), the CDROM presents 60 native

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Laurel McIvor, Co-ordinateur pédagogique des jardins botaniques canadiens, c/o Jardin Botanique de Montréal, 4101, Sherbrooke St. E. Bureau 318, Montréal, Québec H1X 2B2, Canada. Tel : (514) 872-5420 (Montréal), (905) 527-1158 ext. 519 (Hamilton). Fax : (514) 872-3765. Email : Erreur! Signet non défini. Site Internet : [www.rbg.ca/greenlegacy](http://www.rbg.ca/greenlegacy). Pour des informations de réservation: <http://nature.ca/exhibits>

### Chili

#### CD-Rom sur les Plantes Indigènes

Le Jardin Botanique National du Chili, Vina del Mar, a publié un CD-Rom sur les plantes indigènes du Chili. A l'intention des élèves du primaire (7 à 10 ans), le CD présente soixante espèces indigènes avec des photos de fleurs, feuilles, fruits et graines. Des copies du CD ont été distribuées aux écoles de la région de Valparaiso par le ministère de l'éducation, et au niveau national, par la Société Nationale des Forêts. Ce travail a été possible grâce au soutien du Stanley Smith Horticultural Trust US et a été réalisé par Maria Teresa Concha (directrice de l'éducation) et Marcia Ricci (directeur). Pour plus d'informations contacter Marcia Ricci. Jardin Botánico Nacional, Casilla 317, Viña del Mar, Chile. Tel: 56 32 67 2566. Fax: 56 32 67 2566. Email: bioricci@yahoo.com

### Inde

#### Nouveau centre d'Éducation à l'Environnement

L'université de Guru Nanak Dev à Amritsar transforme son jardin botanique en un centre important pour l'éducation à l'environnement. Les étudiants participent bénévolement à l'entretien du jardin et de nouveaux panneaux d'interprétation en anglais et en punjabi ont été installés. Récemment, un théâtre en plein-air pouvant contenir 200 personnes a été construit. Pour plus d'informations, contactez : Dr. Amarjit Singh, Botanical Garden, Guru Nanak Dev University, Department of Biology, Amritsar 143 005, Punjab, Inde. Tel: 91 (0) 258 80 209.

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Para más información contactar a Laurel McIvor, Coordinador de educación de Jardines Botánicos Canadienses, c/o Jardin Botanique de Montreal, 4101, Sherbrooke St. E. Bureau 318, Montreal, Québec H1X2B2, Canada. Tel: (514)872-5420 (Montreal), (905)527-1158 ext.519 (Hamilton). Fax: (514)872-3765. Email: lmcivor@rbg.ca Website: [www.rbg.ca/greenlegacy](http://www.rbg.ca/greenlegacy). Información para reservaciones: <http://nature.ca/exhibits>

### Chile

#### CD-Rom de Plantas Nativas

El Jardín Botánico Nacional de Chile en Viña del Mar, ha publicado un CDROM de plantas de Chile. Dirigido a estudiantes de primaria de 7-10 años, el CDROM presenta 60 especies nativas con fotografías de hojas, flores, frutos y semillas. Incluyen una pequeña descripción de cada una de las especies, un glosario, un cuadro explicativo y un mapa de distribución. Se han distribuido copias del CD a todas las escuelas de la región de Valparaíso a través del Ministerio de Educación y al resto del país a través de la Corporación Nacional Forestal. La realización de este trabajo fue posible gracias al apoyo de la Fundación The Stanley Smith Horticultural Trust. Las autoras son María Teresa Concha (Jefa de Educación) y María Ricci (Directora). Para más información contactar a María Ricci, Jardin Botánico Nacional, Casilla 317, Viña del Mar, Chile. Tel: 56 32 67 2566. Fax: 56 32 67 2566. Email: bioricci@yahoo.com

### India

#### Nuevo Centro de Educación Ambiental

La Universidad Guru Nanak Dev en Amritsar está transformando su jardín botánico en un importante centro de educación ambiental. El trabajo voluntario de los estudiantes consiste en el mantenimiento e instalación de nuevos letreros interpretativos en inglés y en punjabi. Recientemente se construyó un teatro al aire libre para 200 personas. Para más información contactar a: Dr. Amarjit Singh,

Left: Green Legacy, an interactive travelling exhibition, is currently touring Canadian botanical gardens and museums



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species through photographs of flowers, leaves, fruits and seeds. There is a small description of each species with a glossary, an explanatory picture and a distribution map. Copies of the CDROM have been distributed to all schools in the Valparaíso region by the Ministry of Education and nationwide by the National Forest Corporation. The work was made possible by the support of The Stanley Smith Horticultural Trust US and was produced by Maria Teresa Concha (Head of Education) and Marcia Ricci (Director). For further information contact: Marcia Ricci, Jardín Botánico Nacional, Casilla 317, Viña del Mar, Chile. Tel: 56 32 67 2566. Fax: 56 32 67 2566. Email: bioricci@yahoo.com

### India

#### New Eco-Education Centre

Guru Nanak Dev University in Amritsar is developing its botanical garden into an important centre for eco-education. Students are voluntarily helping with the upkeep of the garden and new interpretative labels in English and Punjabi have been installed. Recently constructed is an open-air theatre with a capacity for 200 people. For more information contact: Dr Amarjit Singh, Botanical Garden, Guru Nanak Dev University, Department of Biology, Amritsar 143 005, Punjab, India. Tel: 91 (0) 258 80 209.

#### World Environment Day 2002

Hundreds of students participated in the celebrations for World Environment Day 2002, held at the National Botanical Research Institute Lucknow.

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#### Journée Mondiale de l'Environnement 2002

Des centaines d'élèves ont participé aux célébrations pour la journée mondiale de l'environnement 2002 qui se sont déroulées à l'Institut National de Recherches Botaniques de Lucknow. Les enfants de 5 à 10 ans ont participé à un concours de dessin intitulé 'l'environnement à Lucknow', tandis que les 11-18 ans participaient à un 'parcours nature' et un concours de rédaction de slogans/promesses. Les dessins des élèves étaient révélateurs de la façon dont ils perçoivent leur ville. Lucknow était représentée comme une ville pleine de déchets avec l'avertissement que si rien ne changeait, la ville entière deviendrait une poubelle ! Le parcours nature était organisé par des scientifiques du Centre d'Education à l'Environnement. Ce parcours était installé dans le jardin d'éducation à l'environnement qui comprend un jardin pour les malvoyants et un jardin familial modèle pour les ménages en milieu rural. Les élèves recevaient des informations sur les plantes et avaient un temps pour explorer librement le parcours nature, avant de remplir un questionnaire. Ils ont également rédigé des slogans/promesses qui reflétaient leur engagement pour un environnement propre et un avenir durable.

Engagements gagnants du concours

Aujourd'hui, journée mondiale de l'environnement, je m'engage à :

- réduire ma consommation de plastique au maximum à partir d'aujourd'hui
- ne plus gâcher de papier
- planter plus d'arbres pour rendre mon environnement plus vert et plus propre
- ne plus jeter de déchets directement dans les égouts
- toujours utiliser du papier écologique

Le programme de la journée s'est terminé avec un goûter et une cérémonie de distribution des prix. Pour plus d'informations, contactez :

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Botanical Garden, Guru Nanak Dev University, Department of Biology, Amritsar 143 005, Punjab, India. Tel: 91(0)258 80 209.

#### Día Mundial del Medio Ambiente 2002

Cientos de estudiantes participaron en las celebraciones del Día Mundial del Medio Ambiente del 2002 realizado en el Instituto Nacional de Investigación Botánica de Lucknow. Los de 5 a 10 años de edad participaron en el concurso de dibujo "El ambiente de Lucknow", mientras que los de 11 a 18 años participaron en el "Sendero de la Naturaleza" y en una competencia escrita de lemas y promesas ambientales. Los dibujos de los alumnos representaban claramente cómo perciben su ciudad. Lucknow es vista como una ciudad llena de basura y de continuar en las condiciones actuales toda la ciudad se convertirá en un basural! El "Sendero de la Naturaleza" lo organizaron los científicos del centro de Eco-Educación. El sendero incluyó un recorrido para incapacitados visuales y un jardín modelo para casas de comunidades rurales. A los estudiantes se les proporcionó información sobre las plantas y después se le dio tiempo para explorar el sendero antes de llenar un cuestionario. Los estudiantes también escribieron lemas y promesas que reflejaban su compromiso para una ambiente más limpio, más verde y más sustentable.

Peticiones ganadoras:

Hoy, en este Día Mundial del Medio Ambiente, prometo:

- A partir de hoy reducir lo más posible el uso de plásticos
- No desperdiciar papel
- Plantar más árboles para que mi entorno esté más limpio y verde
- No tirar basura directamente en los drenajes
- Utilizar siempre papel ecológico

El programa de la celebración terminó con una refrigerio ecológico y con la ceremonia de entrega de premios. Los

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Five to 10 year olds took part in a drawing competition entitled 'The Environment of Lucknow', while 11-18 year olds participated in a 'Nature Trail' and slogan/pledge writing competition. Student's drawings spoke volumes about the way in which they saw their city. Lucknow was depicted as a city full of garbage with a warning that if the present conditions continued the entire city would become a dustbin! The Nature Trail was organised by the scientists of the Eco-education Centre.



The trail took place in the eco-education garden, which comprises a garden for the visually impaired and a model home garden for rural households. Students were provided with information about the plants and then given time to explore the nature trail themselves before completing a questionnaire. Students also wrote slogans and pledges that reflected their commitment towards a clean and green environment for a sustainable future.

Prize winning pledge

Today, on this World Environment Day, I swear in that

- I will reduce my use of plastics as much as possible from today onwards
- I will not waste paper
- I will plant more trees to make my surroundings clean and green
- I will not throw rubbish in the drains directly
- I will always use eco-friendly papers

## Nouvelles



Kamla Kulshreshtha, Eco-education Centre, National Research Institute, Rana Pratap Marg, Lucknow – 226001, Inde.

### Visite d'Alexander en Australie

Alexander Amirtham, un éducateur environnement du sud de l'Inde a assisté au congrès International sur l'Education dans les Jardins Botaniques en septembre dernier à Sydney pour faire une présentation sur 'l'importance des clubs nature pour les élèves et leurs communautés'. Sa participation au congrès et son séjour de trois semaines en Australie ont été possibles grâce au généreux mécénat des Amis du Jardin Botanique d'Albury. Pendant son séjour, Alexander a fait un certain nombre de présentations aux visiteurs et au personnel du Jardin Botanique National d'Australie à Canberra et du Jardin Botanique Royal de Melbourne. Il a également assisté à la conférence de l'association des Amis des Jardins Botaniques à Ballarat, Victoria et a participé aux célébrations du 125ème anniversaire du Jardin Botanique d'Albury.

### Indonésie

#### Première Formation pour les Professeurs

Sous l'égide du HSBC « Programme Investissement Nature en Indonésie » une formation pour les enseignants a été organisée au Jardin Botanique de Cibodas du 8 au 10 avril 2003, dont le

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Left: During World Environment Day 2002, children in Lucknow entered a drawing competition run at the National Botanical Research Institute. Their pictures illustrate how they view their city



premios los otorgó el Secretariado de WWF India, Uttar Pradesh State Office. Para mayor información contactar a: Kamla Kulshreshtha, C.S. Mohanty, P.K. Srivastava, Msingh y P. Pushpangadan, Eco-education Centre, National Botanical Research Institute, Rana Pratap Marg, Lucknow 226001, India.

### Visita de Alexander a Australia

Alexander Amirtham, educador ambiental del sur de India asistió al Congreso Internacional de Educación en Jardines Botánicos de BGCI en Sydney el pasado septiembre presentando la conferencia "El valor de los clubes ambientales para los escolares y sus comunidades". Su asistencia al Congreso y su posterior permanencia de tres semanas en Australia fue posible gracias al generoso apoyo de Los Amigos del Jardín Botánico de Albury. Durante sus estadia Alex dio diversas charlas para

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The day-long programme finished with eco-friendly refreshments and a prize distribution ceremony. Prizes were presented by the Secretary of the World Wide Fund for Nature, India, Uttar Pradesh State Office. For more information contact: Kamla Kulshreshtha, C. S. Mohanty, P.K. Srivastava, M.Singh and P. Pushpangadan, Eco-education Centre, National Botanical Research Institute, Rana Pratap Marg, Lucknow – 226001, India.

### Alexander's Visit to Australia

Alexander Amirtham, an environmental educator from Southern India, attended the BGCI International Congress on Education in Botanic Gardens in Sydney last September to present a paper on 'The value of Eco-clubs to schoolchildren and their communities'. His attendance at the Congress and subsequent three-week stay in Australia was due to the generous sponsorship of the Friends of the Albury Botanic Gardens. During his stay Alex gave a number of presentations to visitors and staff of the Australian National Botanic Gardens, Canberra and the Royal Botanic Gardens Melbourne. He also attended the Association of Friends of Botanic Gardens Conference in Ballarat, Victoria and joined in the 125th Anniversary celebrations of the Albury Botanic Gardens.

Right, Far Right and Below: Teachers participating in the first teachers' training course in Cibodas under the HSBC Investing In Nature Indonesia Programme



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dernier jour coïncidait avec le 151<sup>ème</sup> anniversaire du Jardin. Cette formation était une première pour le Jardin de Cibodas et 47 professeurs y ont participé, représentant chacun une école située dans les environs immédiats du Jardin Botanique. L'événement était couvert par 16 journalistes des médias locaux et nationaux.

Avant la formation, une réunion s'est tenue avec les enseignants afin de discuter du statut de l'Éducation à l'Environnement dans les écoles, les problèmes qu'ils ont rencontrés et une approche sur la manière d'intégrer l'Éducation à l'Environnement dans le programme scolaire. Pendant la formation, l'équipe du Jardin Botanique et des Organisations Non Gouvernementales locales ont donné des conférences et ont animé des groupes de discussion. Le bilan de cette rencontre a été très positif et l'équipe d'Investissement Nature va mettre à profit cette expérience pour développer de nouvelles formations pour les professeurs. Pour plus d'information, contacter : Bian Tan, Kebun Raya Bogor, Jln. Ir. H. Juanda

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visitantes y personal de los Jardines Botánicos Nacionales de Australia, Canberra y Melbourne. También participó en la reunión de la Asociación de los Amigos del Jardín Botánico en Ballarat, Victoria y en las celebraciones del 125 aniversario del Jardín Botánico de Albury.

### Indonesia

#### Primer Curso de Formación para Profesores

Coincidiendo con el 151 Aniversario del Jardín Botánico de Cibodas fue desarrollado un curso de formación para profesores auspiciado por el Programa Invirtiendo en Naturaleza Indonesia del HSBC, el 8-10 de Abril, 2003. Fue el primer curso en Cibodas Gardens, con un total de 47 profesores, cada uno representando una escuela del distrito en el que se ubica el jardín. El evento tuvo cobertura mediática a través de 16 representantes de los medios de difusión locales y nacionales.

Previo al curso en una reunión con los docentes se estableció el estado de la educación ambiental en las escuelas y

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### Indonesia

#### First Teachers' Training Course

A teachers' training course under the HSBC Investing in Nature Indonesia Programme was held at the Cibodas Botanic Garden from April 8-10, 2003, coinciding with the Gardens' 151st anniversary celebrations on the final day. This course was a first for Cibodas Gardens, with a total of 47 teachers in attendance, each representing a school in the district immediately adjacent to the gardens. The event was covered by 16 representatives from local and national media.

Prior to the course, a meeting was held with the teachers to find out the status of environmental education in schools, the problems they encountered, and ideas on how to make environmental education part of the school curriculum. During the course, staff of the botanic garden and local NGOs gave presentations and facilitated discussion groups. The feedback on the course was overwhelmingly positive and the Investing in Nature team will use this information to develop future teachers' training programmes. Most teachers had no previous knowledge of the role botanic gardens played in environmental research, conservation, and education, and were grateful for the chance to increase their knowledge and understanding of botanic gardens and the natural world. For more information contact: Bian Tan, Kebun Raya Bogor, Jln. Ir. H. Juanda No. 13, Bogor, Indonesia. Tel: (62) 251 336 935. Email: [Bian\\_Tan@bgci.org.uk](mailto:Bian_Tan@bgci.org.uk)

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### Italie

#### Ateliers Régionaux en Italie

Le 5 mai au Jardin Botanique de Ghilardi à Salò se sont tenus des ateliers et des conférences sur l'éducation destinés aux personnels des Jardins Botaniques de Lombardie (région au Nord de l'Italie) qui ont rencontré un très vif succès. Cette manifestation est née d'une collaboration entre le Parc Alto Garda Bresciano et le BGCI avec le soutien de la Société Botanique d'Italie, la section lombarde de la Société Botanique d'Italie (SBILO) et l'Association National des Musées Scientifiques. Le but de cette réunion était de créer un réseau des Jardins Botaniques dans la région de Lombardie.

Plus de 30 personnes des Jardins Botaniques régionaux étaient inscrits. Le matin, les participants ont effectué une série d'activités éducatives interactives qu'ils pourront mettre en application dans leur propre jardin avec des enfants âgés de 10 à 13 ans. L'après-midi, ils ont suivi une série de conférences sur le rôle social des Jardins Botaniques. Cette session était ouverte à une audience plus large, et des politiciens, des journalistes et d'autres diverses personnes intéressées y ont participé. Pour plus d'information, contacter : Fiorenza Tisi, Museo Tridentino di Scienze Naturali, via Calepina 14, I 38100 Trento, Italy. Email: [tisi@mtsn.tn.it](mailto:tisi@mtsn.tn.it)

### Russie

#### Atelier d'Éducation pour les Jardins Botaniques Russes

En Russie, la première conférence ciblée sur l'éducation dans les Jardins Botaniques s'est déroulée du 14 au 17 mai au Jardin Botanique de l'Université de Moscou (Apothecary). Ont participé à cette rencontre des représentants des Jardins Botaniques de Russie, du Ministère des Ressources Naturelles, du Ministère de l'Éducation, des ONG,

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las dificultades que enfrentaban e ideas para lograr que esta educación forme parte del curriculum formal. A lo largo del curso el personal del jardín botánico, junto a otras ONG locales hicieron presentaciones y facilitaron la discusión por grupos. La respuesta fue muy positiva y el equipo de Invirtiendo en Naturaleza usará esta experiencia para futuros programas de educación del profesorado. La mayoría de los asistentes no conocían el importante papel que los jardines botánicos tienen en la investigación ambiental, la conservación y la educación, y se mostraron agradecidos por la oportunidad brindada de aumentar su conocimiento y comprensión de la función de los jardines botánicos en relación con el mundo natural. Más información: Bian Tan, Kebun Raya Bogor, Jln. Ir. H. Juanda No. 13, Bogor, Indonesia. Tel: (62) 251 336 935. Email: [Bian\\_Tan@bgci.org.uk](mailto:Bian_Tan@bgci.org.uk)

### Italia

#### Taller Regional en Italia

El Jardín Botánico de Ghilardi en Salò ha realizado un taller y conferencia muy exitosos para los jardines botánicos de la región de Lombardia del Norte de Italia el 5 de Mayo. Fue una colaboración entre el Parco Alto Garda Bresciano y la BGCI, apoyada por la Sociedad Botánica Italiana, la sección Lombarda de la misma sociedad (SBILO) y la Asociación Nacional de Museos Científicos. El objetivo del encuentro fue crear una red de Jardines Botánicos de la Región de Lombardía.

Acudieron más de 30 empleados de los jardines botánicos de la región y las mañanas fueron dedicadas a un conjunto de actividades educativas interactivas, listas para ser usadas en sus jardines con estudiantes de 10-13 años. Por la tarde los participantes asistieron a la charla el papel de los jardines botánicos en la sociedad también concurrieron autoridades locales, representantes de los medios de comunicación y otros grupos de interesados. Contacto: Fiorenza Tisi, Museo Tridentino di Scienze Naturali, via Calepina 14, I 38100 Trento, Italy. Email: [tisi@mtsn.tn.it](mailto:tisi@mtsn.tn.it)

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### Italy

#### Regional Workshop in Italy

A very successful education workshop and conference for botanic gardens in the Lombardia region of Northern Italy was held on 5 May at the Ghilardi Botanic Garden in Salò. This was a collaborative venture between the Parco Alto Garda Bresciano and BGCI and supported by the Italian Botanical Society, the Lombardia section of the Italian Botanical Society (SBILO) and the National Association of Scientific Museums. The aim of the meeting was to create a network of botanic gardens in the Lombardia region.

Over 30 staff from the region's botanic gardens attended. During the morning, staff participated in a series of interactive education activities that could be used in their own gardens with children aged 10-13 years. During the afternoon session, staff listened to a series of presentations on the role of botanic gardens in society. This session was open to a wider audience and included politicians, representatives from the media and other interested parties. For further information contact: Fiorenza Tisi, Museo Tridentino di Scienze Naturali, via Calepina 14, I 38100 Trento, Italy. Email: tisi@mtn.tn.it

### Russia

#### Russian Botanic Garden Education Workshop

The first Russian conference focusing on botanic garden education took place from 14 to 17 May at the Moscow University Botanic (Apothecary) Garden. It was attended by representatives from Russia's botanic gardens, Ministry of Natural Resources, Ministry of Education, NGOs and BGCI. This important event explored contemporary environmental education issues, a range of teaching methodologies, education strategy development, and networking. Further details are available from Dr Alla Andreeva, Education Officer, Moscow University Botanic (Apothecary) Garden, Prospect Mira 26, 129090 Moscow, Russia. Tel/fax: (+7095) 280

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et du BGCI. Cet événement important avait pour thématiques les problèmes actuels d'Éducation à l'Environnement, une approche des diverses méthodologies d'enseignement, le développement de stratégies d'éducation et le travail en réseau. Des détails sont disponibles par Dr Alla Andreeva, Education Officer, Moscow University Botanic (Apothecary) Garden, Prospect Mira 26, 129090 Moscow, Russia. Tel/fax: (+7095) 280 7222, 280-5880, 280-6765. Email: edu-bgmu@mtu-net.ru and alla-bgmu@mtu-net.ru

### Afrique du Sud

#### Nouveau Centre d'Éducation à l'Environnement

L'équipe d'éducation du Jardin Botanique National de Pretoria a déménagé dans un nouveau Centre d'Éducation situé dans le Jardin. La construction de ce bâtiment a été rendue possible par des subventions versées par le Département des Affaires Environnementales et le Fonds Touristique d'Assistance contre la Pauvreté.

Le Centre d'Éducation à l'Environnement comporte des bureaux pour les quatre personnes de l'équipe d'animation, une salle d'une capacité de 150 places, une cuisine, une salle de rangement, et une salle pour la consultation des ouvrages. Celle-ci sert de centre d'information pour les enseignants et les étudiants voulant se documenter sur l'Éducation à l'Environnement. La Loreto Scholl de Queenswood a gentiment offert cinq microscopes pour équiper cette salle et permettre aux étudiants et aux enseignants de conduire des travaux de laboratoire et des études. La grande salle est utilisée pour l'accueil des groupes scolaires, les ateliers d'enseignants, les autres services du Jardin. De plus, cette salle est mise également à la disposition des organisations qui conduisent des activités relatives à l'Environnement. Pour plus d'information, prendre contact avec Arlene de Bruyn, Head: Pretoria Garden Education Section. Email: arlene@nbipre.nbi.ac.za

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### Rusia

#### Taller Ruso en Educación en Jardines Botánicos

La primera conferencia rusa centrada en la educación en jardines botánicos tuvo lugar en el Jardín Botánico (Farmacéutico) de la Universidad de Moscú, 14-17 Mayo. Acudieron representantes de los jardines botánicos de Rusia, del Ministerio de Recursos Naturales, Ministerio de Educación, ONGs y BGCI. Este importante evento profundizó en las cuestiones más actuales de la educación ambiental, metodologías de enseñanza, desarrollo de estrategias educativas y creación de redes. Para más detalles dirigirse a Dr Alla Andreeva, Education Officer, Moscow University Botanic (Apothecary) Garden, Prospect Mira 26, 129090 Moscow, Russia. Tel/fax: (+7095) 280 7222, 280-5880, 280-6765. Email: edu-bgmu@mtu-net.ru and alla-bgmu@mtu-net.ru

### Sudáfrica

#### Nuevo Centro de Educación Ambiental

Los educadores del Jardín Botánico Nacional de Pretoria se han mudado a un nuevo centro de educación ambiental dentro del Jardín. La construcción de esta instalación ha sido posible gracias a la ayuda recibida del Departamento del Medio Ambiente y Turismo con fondos de ayuda a la pobreza. Este nuevo Centro incluye oficinas para un equipo educativo de 4 personas, un salón para 150 personas, cocina, baños y almacén, así como sala de recursos. Esta sala sirve de centro de información para profesores y discípulos de educación ambiental. La Loreto School de Queenswood amablemente donó 5 microscopios para esta sala, lo que permite a los docentes y alumnos el trabajo de laboratorio y de proyectos. El hall se usa para talleres y grupos así como para otros departamentos y organizaciones. Contacto: Arlene de Bruyn, Head: Pretoria Garden Education Section. Email: arlene@nbipre.nbi.ac.za

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Email: edu-bgmu@mtu-net.ru and  
alla-bgmu@mtu-net.ru

### South Africa

#### New Environmental Education Centre

Education staff at the Pretoria National Botanical Garden have moved into a new environmental education centre in the Garden. The construction of this facility was made possible by a grant received from the Department of Environmental Affairs and Tourism's poverty relief fund.

The EE Centre includes office accommodation for the education team of four, a hall with seating for 150 people, kitchen, toilet and storage facilities as well as a resource room. The resource room serves as a centre for EE information to teachers and learners. Loreto School, Queenswood, kindly donated five microscopes for use in the resource room, enabling learners and teachers to undertake laboratory and project work. The hall is used for school groups and teacher workshops and also by other departments and organisations for activities relating to core business. For more information contact: Arlene de Bruyn, Head: Pretoria Garden Education Section. Email: arlene@nbipre.nbi.ac.za

### UK

#### Thank Yew

An eye-catching poster highlighting the importance of medicinal plants has been produced by the University of Oxford Botanic Garden. The poster's image of a nude woman clutching her breasts, aims to catch the attention of young adults. It focuses on a number of medicinal plants including Yew (*Taxus baccata*), the extract of which, is used to cure breast, ovarian and cervical cancer. For a free copy of the poster contact: Louise Allen, Oxford University Botanic Garden, Rose Lane, Oxford, OX1 4AX, U.K. Tel: 01865 286690 Fax 01865 275074. Email: louise.allen@botanic-garden.ox.ac.uk

## Nouvelles



### Royaume-Uni

#### Merci l'if !

Une affiche très attractive souligne l'importance des plantes médicinales qui ont été étudiées à l'Université du Jardin Botanique d'Oxford. Le but du poster étant d'attirer l'attention des jeunes adultes, l'image représente une femme nue empoignant ses seins. Il fait aussi le point sur plusieurs plantes médicinales, en particulier l'if (*Taxus baccata*), dont l'extract est utilisé pour soigner les cancers du sein de l'ovaire, et du col de l'utérus. Pour obtenir un exemplaire gratuit de ce poster veuillez prendre contact avec : Louise Allen, Oxford University Botanic Garden, Rose Lane, Oxford, OX1 4AX, U.K. Tel: 01865 286690 Fax 01865 275074. Email: louise.allen@botanic-garden.ox.ac.uk

#### Annuaire du BGEN

La Revue du Réseau des Educateurs des Jardins Botaniques de l'année 2002 est maintenant disponible. Il donne des nouvelles des membres, présente des articles sur "le développement durable et le Jardinage écologique", sur les programmes d'éducation organisés par les membres, ainsi que les comptes rendus des principales conférences qui se sont tenues au cours de l'année 2002. Est inclus celui sur le V Congrès International sur l'Education dans les

## Noticias



### Reino Unido

#### Gracias a ti, Tejo

El Jardín Botánico Universitario de Oxford ha editado un atractivo cartel que destaca la importancia de las plantas medicinales. La imagen es la de una mujer desnuda que se agarra los pechos, el objetivo es llamar la atención a jóvenes adultos/as. Se centra en un conjunto de plantas medicinales que incluyen el Tejo (*Taxus baccata*), cuyo extracto sirve para curar el cáncer de pecho, de ovario y cervical. Para obtener una copia gratis del cartel escribir a: Louise Allen, Oxford University Botanic Garden, Rose Lane, Oxford, OX1 4AX, U.K. Tel: 01865 286690 Fax 01865 275074. Email: louise.allen@botanic-garden.ox.ac.uk

#### Anuario BGEN

La Red de Jardines Botánicos para la Educación (BGEN) dispone ya de su memoria del 2002. Contiene noticias de los miembros, artículos sobre 'Sostenibilidad y Jardinería Ecológica' y los programas educativos de los miembros así como resúmenes de las conferencias más importantes del 2002, incluyendo el V International Congress on Education in Botanic Gardens del BGCI. Para más información: Erica Bower, BGEN Co-ordinator, c/o Museum 1, Royal botanic

Left: By using strong imagery, the University of Oxford Botanic Garden has been very successful in conveying the importance of medicinal plants to young adults

## ■ News

### BGEN Year Book

The Botanic Gardens Education Network review of 2002 is now available. It contains news from members, articles on 'Sustainability and Greener Gardening' and members' education programmes as well as reviews on relevant conferences during 2002, including the BGCI V International Congress on Education in Botanic Gardens. For more information contact: Erica Bower, BGEN Co-ordinator, c/o Museum 1, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Tel/Fax: 020 8241 8915. Email: erica\_bgen@hotmail.com

### BGEN Conference

Ways into Literacy and Numeracy was the title of a BGEN training day held this April at the University of Birmingham Botanic Garden. Over 25 participants attended the one-day conference, which looked at the many ways in which plants and the environment can be used to teach numeracy and literacy to children in schools and gardens. During the conference BGEN also held its Annual General Meeting where the year's activities and finances were reviewed and members were voted onto the committee. For more information contact: Erica Bower, BGEN Co-ordinator, c/o Museum 1, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Tel/Fax: 020 8241 8915. Email: erica\_bgen@hotmail.com

## USA

### Learning Habitats

In response to the many requests of 'How can we plant a garden at our school that we can use for teaching?', the Minnesota Landscape Arboretum has embarked on a two year project called Learning Habitats: Models for Neighborhood Schools. When completed, there will be six model landscapes for replication in schoolyards. The hope is that the models will serve as a resource to educators for years to come.

Initial teacher workshops are scheduled for Autumn 2003 and Spring 2004, during which the landscape designs, plant lists, and relevant

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Jardins Botaniques du BGCI. Pour plus d'information, prendre contact avec : Erica Bower, BGEN Co-ordinator, c/o Museum 1, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Tel/Fax: 020 8241 8915. Email: erica\_bgen@hotmail.com

### Conférence du BGEN

Au cours du mois d'avril, le BGEN organisé une journée de formation intitulée "Les méthodes pour apprendre à lire, à écrire et à compter", à l'Université de Jardin Botanique de Birmingham. Plus de 25 participants étaient présents à cette journée qui faisait le point sur les manières d'utiliser les plantes et l'environnement pour enseigner, à l'école ou au jardin, l'apprentissage du calcul et de la lecture aux enfants. Au cours de cette journée le BGEN également tenu son Assemblée Générale annuelle, et les membres ont procédé au vote du bilan financier et moral de l'association. Pour plus d'information, prendre contact avec : Erica Bower, BGEN Co-ordinator, c/o Museum 1, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Tel/Fax: 020 8241 8915. Email: erica\_bgen@hotmail.com

## Etats-Unis d'Amérique

### Etudier les milieux naturels

"Comment pouvons nous aménager un jardin pédagogique dans notre école ?". Afin de tenter de répondre à cette demande fréquemment formulée, l'Arboretum du Minnesota s'est lancé dans un projet de deux ans appelé "milieux naturels pour l'apprentissage : maquettes pour les écoles du voisinage". Quand ce programme sera terminé, il aura six maquettes de paysages disponibles pouvant être dupliquées dans les cours d'écoles. Nous espérons que ces maquettes servent de références aux éducateurs dans les années à venir.

Les ateliers pour les premiers professeurs sont déjà planifiés de l'automne 2003 au printemps 2004. Au cours de ces ateliers, pour chaque milieu, les aménagements, la liste des plantes, l'articulation avec les programmes scolaires seront discutés et répartis. Les six milieux comprennent:

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Gardens, Kew, Richmond, Surrey TW9 3AB. Tel/Fax: 020 8241 8915. Email: erica\_bgen@hotmail.com

### BGEN Conference/ Conferencia del BGEN

Caminos hacia la alfabetización, incluida la en matemáticas, fue el título de un día de aprendizaje desarrollado en el Jardín Botánico de la Universidad de Birmingham en abril. Más de 25 participantes asistieron a la conferencia en un día en que se abordaron las muchas formas y maneras en que las plantas y el medio ambiente pueden ser aprovechados para enseñar los números y las letras tanto en el jardín como en las escuelas. Durante la conferencia el BGEN celebró su Reunión Anual General dando cuenta de las actividades, finanzas, y se eligió el nuevo comité. Contacto: Erica Bower, BGEN Co-ordinator, c/o Museum 1, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Tel/Fax: 020 8241 8915. Email: erica\_bgen@hotmail.com

## EEUU

### Hábitats para la Enseñanza

En respuesta a preguntas del tipo '¿Cómo podemos plantar un jardín que nos sirva para la enseñanza?', el Minnesota Landscape Arboretum ha lanzado un proyecto de dos años que se llama 'Learning Habitats': Modelos para las Escuelas Vecinas. Cuando se complete habrá 6 modelos de paisajes para su reproducción en los patios escolares. La esperanza es que los modelos sirvan como recurso docente para los años venideros.

Para el Otoño 2003 y la Primavera 2004 están programados los primeros talleres con profesores, durante los cuales se distribuirán los diseños de paisaje, las listas de plantas y se discutirán los aspectos pertinentes del currículum para cada uno de los hábitats. Los 6 hábitats incluyen: cultivo en camas elevadas para lugares sin suelo o pobres, una plantación especial para atraer aves, jardín de otoño y primavera, un pedazo de pradera, otro de bosque y una muestra

## ■ News

classroom curriculum (for each of the habitats) will be discussed and distributed. The six habitats include; raised beds for a site with poor or no soil, a planting to attract birds, a spring/fall garden, a prairie patch, a woodland planting, and a sample outdoor learning station. The planning of this project is being done by staff in the Arboretum Education department, the design by a Master of Landscape Architecture candidate, and the installation and maintenance by a group of urban teenagers participating in the Arboretum's horticulture entrepreneur programs.

For further information contact: Tim Kenny, Assistant Director of Education, Minnesota Landscape Arboretum, 3675 Arboretum Drive, PO Box 39, Chanhassen, MN 55317, USA. Tel: (952) 443-1448. Fax: (952) 443-2823. Email: [tim@arboretum.umn.edu](mailto:tim@arboretum.umn.edu)

### **New Plant Conservation Biology Programme**

The School of the Chicago Botanic Garden has teamed up with Loyola University to offer a joint academic programme in plant conservation biology. The course began in spring 2002 and is taught by plant conservation scientists at the botanic garden and staff at Loyola University. Students work both at Loyola and at the Botanic Garden, which enables them to have direct learning experience in its 385 acre living collection. Dr Kayri Havens, Director, Department of Conservation Science and the Institute for Plant Conservation Biology, housed at the Chicago Botanic Garden states that 'Although diverse and healthy plant communities are necessary to support human life, plant diversity throughout the world is in jeopardy. The certificate program with Loyola is a step toward addressing society's global challenge of preserving plants for the future of humankind'. For more information visit the Chicago Botanic Garden web sites: [www.chicagobotanic.org/certificate/pcb.html](http://www.chicagobotanic.org/certificate/pcb.html) or [www.chicagobotanic.org/research/index.html](http://www.chicagobotanic.org/research/index.html)

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des pépinières pour un site ayant un sol pauvre voire pas de sol du tout, des plantations pour attirer les oiseaux, des jardins d'eau et de cascade, une parcelle de prairie, un bois, un point d'information extérieur. Le planning de ce projet a été mis au point par l'équipe du département d'éducation de l'Arboretum, la conception par un étudiant Architecte-Paysagiste, et les installations et la maintenance par un groupe d'adolescents citadins participant à un cours d'entrepreneur en horticulture dispensés par l'Arboretum.

Pour plus d'information, prendre contact avec : Tim Kenny, Assistant Director of Education, Minnesota Landscape Arboretum, 3675 Arboretum Drive, PO Box 39, Chanhassen, MN 55317, USA. Tel: (952) 443-1448. Fax: (952) 443-2823. Email: [tim@arboretum.umn.edu](mailto:tim@arboretum.umn.edu)

### **Nouveaux Cours de Biologie sur la Conservation des Plantes**

L'école du Jardin Botanique de Chicago et l'Université de Loyola se sont associés pour mettre en place un cours académique commun sur la biologie de la conservation des plantes. Les cours ont commencé au printemps 2002. Ils sont dispensés par des scientifiques de la conservation des plantes du Jardin Botanique et le personnel de l'Université de Loyola. Les étudiants travaillent aussi bien à Loyola qu'au Jardin Botanique, ce qui leur permet d'avoir une expérience pratique directe dans 150 hectares de collection vivante. Le Dr Kayri Havens, Directeur du Département des Sciences de la Conservation et de l'Institut pour la Biologie de la Conservation des Plantes, basé au Jardin Botanique de Chicago, déclare "bien que la diversité et la bonne santé des communautés végétales soient nécessaires à la vie de l'espèce humaine, la diversité végétale à travers le monde est en danger. Les cours que nous dispensons avec l'Université de Loyola constituent une première étape afin de relever le défi de la préservation des plantes pour le bien-être et le futur de l'humanité". Pour plus d'information, visitez le site Internet du Jardin Botanique de Chicago : [www.chicagobotanic.org/certificate/pcb.html](http://www.chicagobotanic.org/certificate/pcb.html) ou [www.chicagobotanic.org/research/index.html](http://www.chicagobotanic.org/research/index.html)

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de estación de campo para aprendizaje. La planificación de este proyecto se lleva a cabo por el personal del Departamento de Educación del Arboretum, el diseño por un candidato del Master en Arquitectura del Paisaje, y la instalación y mantenimiento por un grupo de jóvenes urbanos que participan en los programas de horticultura del Arboretum. Contacto: Tim Kenny, Assistant Director of Education, Minnesota Landscape Arboretum, 3675 Arboretum Drive, PO Box 39, Chanhassen, MN 55317, USA. Tel: (952) 443-1448. Fax: (952) 443-2823. Email: [tim@arboretum.umn.edu](mailto:tim@arboretum.umn.edu)

### **Nuevo Programa de Biología de la Conservación de Plantas**

La Escuela del Jardín Botánico de Chicago en colaboración con la Loyola University ofrecen un programa académico en Biología de la conservación de plantas. El curso comenzó en primavera del 2002 y es impartido por personal y científicos de la conservación vegetal del jardín botánico en la Loyola University. El alumnado trabaja tanto en Loyola como en el Jardín lo que les permite tener experiencia directa en sus 385 acres de colecciones vivas. El Dr Kayri Havens, Director del Departamento de Ciencias de la Conservación y el Instituto para la Biología de Conservación de Plantas, ubicado en el Chicago Botanic Garden establece que "a pesar de que las comunidades vegetales más diversas y saludables son necesarias para sostener la vida humana, la biodiversidad vegetal está en peligro en todo el mundo. El programa de certificado con la Loyola es un paso hacia el desafío global de la sociedad por conservar las plantas para el futuro de la humanidad". Mas información en los Sitios web del Chicago Botanic Garden : [www.chicagobotanic.org/certificate/pcb.html](http://www.chicagobotanic.org/certificate/pcb.html) o [www.chicagobotanic.org/research/index.html](http://www.chicagobotanic.org/research/index.html)



**Anarchie ou Ordre?**

Quelques dilemmes à prendre en compte dans la création d'espaces pour les jeunes enfants dans les jardins botaniques

**¿Anarquía u Orden?**

Algunos dilemas en diseñar paisajismo para niños jóvenes en los jardines botánicos

# Anarchy or Order? Some Dilemmas in Designing Landscapes for Young Children in Botanical Gardens

## ■ Summary

Gardens provide amazing environments for young children to play out their imaginations. In a botanic garden, however, such games are often considered inappropriate by professional gardeners or educators. How then can botanic gardens provide play opportunities in ways that do not threaten their larger goals as well as adults' sensibilities of what constitutes a 'beautiful garden'? This article explores these issues and focuses on the potential uses of botanic gardens by young children, primarily of seven years of age and under. It builds an argument for offering a wide range of opportunities that children can enjoy and benefit from including visiting the many parts of a botanic garden that lie beyond what is normally presented to the public.

This article is written from two perspectives. Some insights come from the personal reminiscences of one who grew up in a small nursery in England and who remembers how he and his friends related to the world of plants and growing. It also takes the theoretical perspectives of one who has spent most of his adult life trying to understand how children use the physical environment in order to better plan and design it for them and with them.

## Introduction

In recent years there has been an increase in the recognition by US botanical gardens that there is value in designing specific spaces for young children below eight years of age. This is part of a strategy to increase the use of these gardens by families. It may also reflect the trend in industrialized countries to provide private alternative play spaces for children during an

historical period where there has been decreasing freedom for children to play outdoors (Hart, 1987; Hillman et al, 1991; Hart, 2002). This article looks critically at how spaces in botanic gardens can be designed for the maxim benefit of children and society.

The term 'anarchy' in this article is used in the positive sense to refer to the quality of play as the spontaneous actions of children. It is a particularly useful term for contrasting play with traditional approaches to engaging children in botanical gardens. These two different approaches have implications for very different kinds of landscapes: wild or anarchic versus ordered or controlled. The first thought most people have in inviting children into gardens is to educate them about gardening. But this is a limited view of what a garden can offer young children. The designers of children's areas in botanical gardens, like the

designers of the children's museums that preceded them, have recently recognized the need to incorporate play opportunities into their designs. But I will argue in this article that a major problem with these settings is that, like so many children's museum exhibits, the architects, landscape architects and exhibit designers have usually adopted too narrow a concept of play. They have typically identified specific learning goals for the children in order to design the environment or exhibit to provide this learning through interactive play. But the activities are usually not truly 'interactive' – rather the child is responding to a limited range of options that have been programmed into the design. We need to recognize more fully how children learn through play, in particular children's own capacities to initiate their own actions in a rich physical environment, in order to better design for this kind of learning.

Right: Entrance to the children's play garden at the Brookfield Zoo in Chicago



## Why offer opportunities for young children in botanical gardens?

If we were to ask parents why they bring young children to a botanical garden they would probably tell us that it is first to have a pleasant day out in a natural setting and, second, to inform them about plants and encourage a caring attitude to nature. Botanical garden staff often have a broader view than this and, as the first step in a design process, it is important that they articulate fully the reasons why they think there should be opportunities for young children in botanical gardens. What follows is a summary of some of the typical reasons given, supplemented by my own thoughts.

### • To provide recreational opportunities

As a family strolls through a garden the younger children often frolic on the lawns, frequently feeling bored and tired with just looking. Parents often feel that there should be something for them to do. For many parents a play area like any other good playground would be fine. But to satisfy children in this token way would be a missed opportunity for a botanical garden. Also, it does not seem appropriate for gardens to provide for the typical range of gross motor play found in playgrounds. Climbing, swinging,

sliding and other kinds of physically expansive activity are the only types of play that most public playgrounds typically provide for and it would be a mistake to simply replicate these. Also, these activities are not in keeping with the traditions of botanical gardens as places of tranquility and reflection. We need to think more broadly if we are to incorporate some of the special potentials of botanical gardens into our designs.

### • To promote an understanding of, and a caring concern for, nature

There is a good basis in theory for arguing that in order for young children to learn about and learn to care for nature they need to have free, direct, and unmediated contact with natural environments (Hart and Chawla, 1982; Chawla and Hart, 1988). The role of adults is also crucial but not in their traditional, formal, role of teachers. They rather need to be available to answer questions of children when they need them. In this way affection and care of the natural world is fostered in an informal but more profound way.

To encourage the development of caring for nature we need to build upon children's spontaneous interests in the natural world. But Susan Isaacs presented evidence long ago that preschool children spontaneously ask

more questions and show more interest in the animal world than in the plant world (Isaacs, 1930). It is quite natural to ask if there is then some value in linking animals and plants in botanical gardens. This immediately raises difficult questions about institutional barriers created in relation to scientific categories that make no sense today given our current understanding of ecology. Having to stop short at the end of the plant world in order to leave the animal world to zoological gardens seems unfortunate when considering young children, particularly now that zoos are giving much greater attention to the plant world. An understanding of plant habitats and of wildlife conservation would seem to be every bit as important as gardening in educational programs for young children in botanical gardens.

Most botanical gardens reflect an orientation to the scientific study of plants and to plant production that is from an earlier century. In gardening programs we commonly expose children to classification as scientific knowledge. We also usually teach them that gardening involves rectangular plots and planting in straight lines. Children need opportunities to develop a more sophisticated understanding of human intervention in nature. They should be allowed to more fully experience the plant world and learn to look at it closely before being taught to erase all existing vegetation to create a billiard-table surface of soil in order to engage in monoculture. The sustainable development of the environment implies a different kind of gardening. Children need to learn how to modify habitats so that food resources and beauty are created while also at least maintaining, if not improving these habitats for other living things. In a stewardship gardening program wild spaces would be studied for their potential for sustainable development for humans and their value as wildlife refuges for other living things. Foraging in a diverse botanic landscape is a natural preface to gardening for those who wish to foster stewardship. This could be an extremely enticing way for many children to enter gardening especially because children place a great premium on finding resources (Hart, 1979).



Left: Opportunities to play with natural materials are often missing from children's lives. Construction play of this kind can be most compatible with a children's play garden in a botanical garden

- **To enable children to understand the work of gardening**

Because of our ideas of childhood and our ideas of work we have not only increasingly segregated children from adults we have also segregated the world of play from the world of work. Most children have little opportunity to observe adults at work. They also have few opportunities to discover the joy of working: of defining a task and carrying it out to completion and of discovering the great sense of competence that it can bring. Gardening is one kind of work that children can easily observe and understand. If they have these opportunities, they can gradually learn to imitate them.

- **To foster aesthetic appreciation for the natural world**

We know relatively little about the development of children's aesthetic orientation to the world. Our tendency is to think of children's aesthetic development in terms of their activity in art classrooms but again this concept is too limited. Edith Cobb in a provocative publication entitled 'The Ecology of Imagination in Childhood'

Below: Houses or dens can be constantly built and rebuilt with natural materials from the garden.

concluded from a large analysis of autobiographies that children in the early school-age years seem to have a special intense perceptual engagement with the natural world (Cobb, 1977). Certainly this is a time when children are exploring with fascination the perceptual diversity of the physical world. It is therefore regrettable that gardening programs commonly emphasize the scientific and the technological or production-oriented aspects of the business of gardening, with relatively little attention to the aesthetic: to the observation of the plant world, to the alternative creative design of gardens, to the arranging of flowers to the making of miniature gardens and so on.

### **Alternative ways of learning in botanical gardens**

Given what has been said above about the different potential benefits of botanical gardens for young children it is clear that their engagement should be very different from the stroll gardening experience that is the primary activity of adult visitors. It is also clear that they need to be involved in different ways from the more explicitly educational goals of gardens for older school children. Some

combination of allowing children to be observers and apprentices of others, while also having free space to play and to experiment with gardening if they wish, is probably ideal. There are at least four ways that young children can learn in botanical gardens:

#### **1. Observing and imitating the work of the garden and gardeners**

If we accept that children should be able to understand the work of the garden then this implies that botanical gardens should not have all of the messy and interesting details of work hidden behind bamboo fences or brick walls. At a minimum there should be a good working garden with a greenhouse. The notion that young children only learn from direct manipulation of the environment comes from an overworking of the theory of Piaget (Hart, 1999). Observation and imitation is also important to children. For this reason it is important to simply make greenhouses visually accessible on a daily basis for young children to see seedlings developing into beautiful plants (which may be managed by older children). But children also want to learn through engaging in meaningful acts which exercise their competence. Sadly, we commonly remove children from being able to engage in meaningful activity until they are quite old. In an ideal alternative kind of botanical garden, children would be allowed to observe and occasionally assist, or at least imitate, the work of gardeners all over the garden carrying tools, mixing soil, learning to splice and vine plants, etc. There would be people serving as role models of earth stewardship for children. But botanical gardens are currently organized into 'no-go' and 'all-go' areas. These are mirrored by sets of staff who work with visitors (educators and interpreters) and those who do not (the horticulturalists). Ideally, gardens would begin to rethink these hard divisions.

#### **2. Gardening**

There are many children's gardens that allow children to farm their own plots but there is still a tendency for many of them to be too formal and production oriented. There is great value in allowing children to experiment not only scientifically but also aesthetically with



small gardens of shapes designed by children in groups or as individuals. But providing garden plots for a class of young children will inevitably work for only a few. The discipline of gardening can only come after a desire has been kindled in children. Children learn best when they are inspired to initiate change themselves and at a time when they feel ready to initiate such change. In her Victorian book 'Children and Gardens' Gertrude Jekyll (1908) concluded that children should be given an already finished beautiful garden. This would be the same as building a doll's house and furnishing it, with no opportunity for design by the child.

Whatever the nature of the gardening program, there can only be space for a small number of children to join and to maintain a plot of their own for a season. One alternative is to have a children's garden where visiting children can become involved in whatever activity is happening at the time: mixing soil, turning compost, watering and harvesting etc. At the garden and greenhouse of the Children's Garden in the Brookfield Zoo in Chicago the play workers have learned that young children so much want to help that it is impossible to offer enough watering opportunities! So they have a large collection of small hand pumped misters that are in constant use by small armies of volunteer gardeners. The primary difference then between this model and the one described previously is that in this model the children's activities are segregated from the general work of the garden and from the horticultural staff. While this kind of solution seems less desirable it is probably more practical for most botanical gardens given their administrative structure.

### 3. Shared exhibits for parents and children

Although children of this age group like to learn though play there is also some potential for learning through interactive opportunities with their parents or guardians if the exhibit opportunities are well designed. Parents seem to need these opportunities more than children. They want to feel that they are able to share some knowledge with their children. Rather than specific areas for children

then it might be a better idea throughout a garden to provide interesting pieces of information that parents can discuss with their children. Research has shown that it is valuable if parents can link this dialog to their child's daily life and in particular to events they may do after leaving the garden and returning home.

### 4. Free play in a natural landscape

A primary feature of play is that it is voluntary. Children need to have free, unscheduled time to play; it should not always have to fit into adult plans. Activity that is carried out to order, or is the subject of instruction, is not play. For children under seven years of age, play in a garden can be designed to offer opportunities for exploration of natural materials, for environmental learning and for the imagination. Free play with other children in an appropriate environment can also be extremely important to a child's social development and the development of skills of cooperation, sharing and caring.

The kind of play that children engage in can be greatly affected by the qualities of the physical environment available to them. If we reflect back on some of the best memories of our own childhoods we find that many of them are of relatively wild spaces, not gardens (Lukashock and Lynch, 1956, Clay 1969). The areas of our flower nursery which my father was most ashamed of and hid from everyone else were the areas I and my friends wanted to be in as children: the rubbish dump area behind the greenhouses, under the plant benches, in the tool shed and in the boiler rooms. Similarly, the garden on our street which was so badly tended that the local council threatened to throw the tenants out was the garden which we most wanted to use as young children (Hart, 1977).

What is preferable is a place that is safe and free to explore with many different kinds of materials that allow children to select, manipulate and construct things themselves. Wild areas of nature are particularly valuable. In landscapes that are rich in plant materials children can play with different materials, engage in fantasy play alone or with others, construct

things and generally go about the busy kinds of activities that Maria Montessori called the 'work' of the child. If the definition of 'garden' is that it is a botanical area in a state of ecological arrest then it seems that they are not good settings for children to learn about the natural world - the analysis and ordering of the plant world has all been done by someone before the child came along. In a garden, they are denied the chance to discover the botanical world in an undifferentiated manner. They have no chance to explore and begin to differentiate the plant world with the same sense of wonder that natural scientists have had. But this kind of exploration of diversity is precisely what children of this age range like to do (Carson, 1956). We need therefore to deconstruct the garden if we are to enable children to construct it! Children will be able to find patterns or meanings in it, particularly if they have trained play workers to turn to with their questions and appeals for assistance.

### Barriers to the provision of appropriate play opportunities for young children in botanical gardens

From experience with some of the children's areas being created in botanical gardens in the USA it is possible to begin to summarize what some of the barriers are to providing the kinds of opportunities described above:

#### • The aesthetic tension: Un-designing gardens for play

For young children, under seven or eight years of age, gardens are ideal settings for the kind of play that might best be called 'messing about'. But this is precisely why many parents might not like to find such a setting in a botanical garden. For many of them there is an aesthetic tension in their own back gardens: between their aesthetic goals for a manicured lawn with neat perennial borders and the goals of children for messy, diverse spaces with loose parts that look to most adults like anarchy (Moore, 1977). Many parents have forgotten how important such play was to them and have so completely accepted the new emphasis on formal education and

the consumption of toys and learning materials. It might be thought by many horticulturalists in botanical gardens that there is a fundamental incompatibility of children's free play with the orderly growing of plants.

### • The 'don't touch' ethic

Closely related to the aesthetic tension in botanical gardens is the ethic that visitors may not collect or remove anything from them or even touch them. This ethic pervades the rules, signs and security measures of botanical gardens. The Brooklyn Botanical garden has handled the aesthetic tension and the 'don't touch' ethic tension well. A small corner of anarchy has been established in the corner of their extremely well-manicured garden and clearly informing parents of the value of play. They also offer nearly a more traditional garden for older children, thereby clearly making the point that the play garden is intended to be less ordered and more playful.

### • The training of staff

It is difficult for horticultural educators to accept the idea that specific learning goals should not be the primary focus of provision for this young age group. Their training has been to design programs, not to create environments that afford maximum opportunity for children to become the agents of their own exploration and learning through play. These are two very different orientations. If a botanical garden wishes to correct this problem they would need to hire persons trained in the field of early childhood development or 'play leadership'<sup>1</sup>.

### • The tendency to think of learning opportunities in botanic gardens as exhibits

There is a strong tendency for botanical gardens, like museums, to think of their environments as exhibits rather than as opportunities for sustained learning in a particular place. Designers are trained to design exhibits for specific learning goals rather than the kinds of rich natural settings for self-initiated learning proposed here. The exhibits are designed to entice their visitors to stroll and to keep moving. This emphasis on movement through an exhibit-like environment contrasts with the

tendency of young children in natural settings to play in one place with a degree of lasting absorption and intensity not found in other settings.

### • Parents' conceptions of their young children's learning

Attitudes to young children's development change from decade to decade for a variety of reasons. In the current era of child rearing in the US there is not only an increased fear for children's safety, there is also a concern that children should learn at every opportunity if they are to be able to compete in an increasingly competitive world. For these reasons, parents can now be seen hovering over their young children's learning interactions with environments like never before, particularly when they are visiting an educational institution. They want to help their children respond to the educational content of the exhibits. Parents understand that free play benefits their child's physical growth, health and the development of physical skills but they are often not aware of the many other benefits, such as the environmental learning that can occur through play in a natural setting. Also, the ideology that parents have of child rearing differs greatly. For example, while some parents have a desire to keep their children clean to a degree that would not be possible with some of the garden qualities described in this article, others would encourage their children and even dress them appropriately for it.

### Providing Alternatives for Families

In this article I have argued that the interest by botanical gardens in catering for families leads to some difficult questions of what kinds of opportunities should be made available to children less than eight years of age. This age group is a particular challenge because much of what children would like to do and what would be most valuable

to their environmental learning is not in keeping with the traditions of botanical gardens. In particular, it is good for young children to have opportunities to be in direct, unstructured, contact with natural materials for free play with play workers responding to their interests and questions. It has been suggested therefore that one small part of a botanical garden be sectioned off for free play. This area of the garden should be primarily an adult-free zone, so as to give children a sense of autonomy. Adults of course need to be able to be close by as observers. But it would be unfortunate if the effect of creating play gardens were to be yet another way of segregating children from adults. The play garden area should be thought of as just one of a number of options. The primary conclusion of this article is that the staff of botanical gardens need to first work out clearly what their goals are for young children visiting their garden. Changes in the garden can then take place gradually with observations and interviews with parents as well as children.

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Right: a) Parents hovering over children's in a New York City playground. Play areas for young children need to be designed to give parents maximum confidence in their safety and security so they can play freely without constant mediation

b) Animals are a valuable means of encouraging spontaneous questions about habitats and the world of plants. It might be appropriate to introduce a few small animals into the area of botanical gardens designed for very young children

c) The early childhood period is a time when children have an urge to explore with extraordinary intensity the diversity of the physical world

d) Opportunities to play with natural materials are often missing from children's lives. Construction play of this kind can be most compatible with a children's play garden in a botanical garden



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## ▲ Resumen

Les jardins procurent aux jeunes enfants des lieux pleins de surprises pour exercer leur imagination. Dans un jardin botanique, néanmoins, de tels jeux sont considérés par les jardiniers et les éducateurs comme inappropriés. Comment, alors, les jardins botaniques peuvent-ils proposer des situations ludiques sans que cela menace leurs objectifs les plus larges ainsi que la conception des adultes sur ce qu'est un « beau jardin » ?

Cet article explore cette question et s'intéresse aux utilisations potentielles des jardins botaniques par les jeunes enfants, âgés de sept ans et moins. Il avance des arguments pour proposer une large gamme de situations où les enfants peuvent prendre du plaisir en profitant de nombreuses zones du jardin, ce qui va au-delà de ce qui est habituellement présenté au public.

Cet article est écrit à partir de deux points de vue. Certaines idées viennent de réminiscences personnelles de quelqu'un qui a grandi dans une petite pépinière en Angleterre et qui se souvient comment lui et ses amis étaient en contact avec le monde végétal. Il prend aussi le point de vue théorique de quelqu'un qui a passé une bonne partie de sa vie d'adulte à essayer de comprendre comment les enfants utilisent l'environnement physique dans le but d'améliorer le projet et de le concevoir pour eux et avec eux.

## ● Resumé

Los jardines proporcionan impresionantes ambientes para que los niños puedan vivir sus ilusiones. Sin embargo, dentro de un jardín botánico, tales juegos a menudo son considerados poco propios por los jardineros o educadores profesionales. ¿Como, entonces, pueden los jardines

botánicos proporcionar oportunidades para el juego sin generar conflictos con sus metas principales y las sensibilidades de los adultos sobre lo que se considera un "precioso jardín"?

Este trabajo explora estos temas y se concentra en los posibles usos de los jardines botánicos por los niños, sobre todo de las edades de siete años o menos. Construye un argumento para ofrecer una gran gama de oportunidades para que los niños puedan disfrutar y de las que pueden beneficiarse, incluyendo el que puedan visitar las muchas partes de un jardín botánico que normalmente no se le presentan público.

El trabajo se presenta desde dos puntos de vista. Ciertas ideas emanan de las reminiscencias personales de alguien que se crió en un pequeño vivero en Inglaterra y que recuerdo como el y sus amigos se relacionaban al mundo de las plantas y el cultivo. También utiliza puntos de vista teóricos de alguien que se ha pasado la mayor parte de su vida de adulto tratando de comprender como los niños usan el medio físico para poder planear y diseñarlo mejor para ellos y con ellos.

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Planter pour éduquer

Plantando para la educación

# Planting for Education



Above: Students using the systematic beds as part of the Systematic Course at Cambridge University Botanic Garden

## ■ Summary

The use of plant collections as a means to educate people about plants is as old as the origin of botanic gardens themselves. Today botanic gardens around the world serve to display their living plant collections of scientific, conservation and aesthetic value to the best of their ability. Yet our gardens contain few examples of displays specifically designed for education. As a horticulturist keen on educating people about plants I believe that botanic gardens can further their unique role in educating people about plants by incorporating plantings that have been designed specifically to educate. The benefits are numerous, from enhancing the visitor experience to increasing the ability to promote the

garden. To achieve this successfully it has to come from working together between departments, defining what it is we are trying to achieve and incorporating this into the garden's role and master plan. Maybe we should look more carefully, not at Planting for Education but *Planning for Education?*

## Introduction

The purpose of this article is to explore ways in which the horticultural and educational work of botanic gardens can be combined to design plantings for educational purposes. As a trained horticulturist with an interest in educating people about plants I have over the past twelve years experienced the vital role botanic gardens have in educating people

about the Plant Kingdom. For the past three years I have been in the fortunate position of being able to influence how plant collections are displayed and interpreted in the glasshouses at the Cambridge University Botanic Garden. I will draw on these experiences, and the outcomes of a discussion group held at BGCI's 5th International Congress on Education in Botanic Gardens in Sydney, to examine how we can achieve *Planting for Education*.

## Personal Experience

To begin with, I offer the following thoughts:

1. We cannot assume that, because botanic gardens hold living plant collections, they are actively educating their audiences about them. Equally, we cannot assume that by having an education officer botanic gardens will have good quality plant material and design to support innovative educational work.
2. Botanic gardens are constantly changing and adapting to the different social and political views of the time. Rightly or wrongly, emphasis is still often placed on the core priorities of the botanic garden (scientific research, taxonomy, etc) and not on the holistic nature of sustainable development.

Given the title of the paper, we need to consider:

- What do we mean (collectively) by Planting for Education? and
- Would this be valued as important by the garden?

At Cambridge University Botanic Garden (CUBG) I have been fortunate to work with staff who are keen and



Left: By planting for education botanic gardens can enhance visitor experience

committed about promoting education throughout the garden. Founded in 1762 as a garden to teach students about plants, CUBG has a long tradition of educational plantings. For example the Systematic Beds have been used to educate students and visitors about the taxonomy of the Plant Kingdom and the Dry Garden has been designed and planted to teach visitors about the importance of planting for water conservation. Education is even reflected in our job descriptions. Mine, for example states... 'to provide a greater educational focus for the plant collection housed under glass'. By so doing, greater collaboration between education and horticultural staff is promoted. For example, I have worked closely with education staff and the directorate to develop our five-year plan for the glasshouses and to recommend educational themes for our displays.

Do the horticulturalists in your garden have an educational role written into their job description? Does the garden have a collection policy that includes obtaining of plants for educational purposes?

At CUBG I also have autonomy to set up new displays with written interpretation. But autonomy is not always a good thing; unchecked it can

result in ad-hoc development of the garden's overall education message/s and a lack of collaboration between staff. Horticulture and Education are two distinct fields; they draw on different skills and expertise and this can lead to differences of opinions. On one side horticulturists are seen to advocate a 'hands-off' approach while on the other side, educators are seen to promote a 'hands-on' approach. Clearly there is a need for us to work together (inter-departmental) to use each other's experiences and knowledge to develop educative plant displays.

How? Well, we horticulturists are quite a friendly bunch! Creating time to visit and talk with key horticultural staff is a good start. Find the sympathetic listener; be open to each other's suggestions. Are we trying to do the same thing? Ask questions. If we do not find ways of working together we may miss opportunities to get across educational messages, as I found out in developing a new carnivorous display. A team including the education officer and myself were putting the interpretation together. If I had been alone in writing I would not have known that a key word 'nutrients' is not used in the National Curriculum but the word 'minerals' is used instead. A simple misunderstanding would have led to a poor educational message.

Horticulturists love to talk about their work and love to display plants in creative ways. At CUBG themed educative displays, for example Stimulating Plants, which is based upon Tea and Coffee; or the *Solanaceae* Display, which looks at this wonderfully diverse and well known plant family; or Orchids Made Easy, 'you too can grow these exotic plants at home' all provide a perfect partnership between education, horticulture and marketing. Displays also help in collection management, forward planning and bringing a sense of purpose to a garden's work. They can also help lift a garden's self esteem and pride in what it is doing. For example, Royal Botanic Gardens Sydney received the prestigious *Interpretation Australia's* National Award for Excellence for their indigenous Cadi Jam Ora – First Encounters Garden, an excellent example of *Planting for Education*.

#### **Outcomes from a discussion group meeting held at the 5th International Education Congress in Sydney**

I would like to thank Abdul Karrem (Foundation for the Revitalization of Local Health Traditions, India) and Barbara Kushner-Kurland (Brooklyn Botanic Garden, USA) for their help in developing and compiling this



information. From the outcomes of the discussion group meeting the following main points have been summarized and relevant action points proposed to help education staff develop *Planting for Education* in their gardens.

The **main points** include...

- In promoting *Planting for Education* we have to be logical and plan. We need to first ask why are we wishing to pursue this, for *whom* and *who* does it involve. From this we can then ask *what* does it mean and *how* can it be implemented.
- Botanic gardens need a Master Plan and a Mission Statement. Education and *Planting for Education* has to be a part of this overall view and strategy for the garden.

The following **key action points** are intended to help meet challenges that arise from *Planting for Education*...

- Strengthen internal relationships/structures. Find ways of showing staff your educational

presence and education programmes in the garden and develop cohesion through communication with other departments and within every level of the garden hierarchy. One method may be to develop staff seminars to share experiences.

- Make sure that education has its own master/action plan that is incorporated into the Master Plan. Everything we (educators) do effects other departments, so the *planning* process needs to be in place at the start. Get on the Master Plan team! Find allies in other departments for your ideas and plans and make sure your colleagues understand your views.
- All gardens at some time change their collections, make sure you are ready with your plan when it happens. In the meantime develop education around the collections, for example targeting high leverage groups, i.e. environmental journalists to raise public awareness about your existing garden's, collection and programmes.

- If internal support is limited seek outside support mechanisms. Evaluate the gardens user groups. Evaluation is essential as it helps you respond to perceived needs, highlights support for your collections and programmes, and helps develop plans. For further support link your plans to the schools National Curriculum.
- Be flexible, keep options open and find your allies. For example, Marketing Departments are always looking for new and novel ways to entice visitors to see the garden.

**Conclusion**

If we are to successfully look at *Planting for Education* we have to develop a plan whose ideas are seen as shared. All staff within botanic gardens have knowledge they wish to share and tapping into this will provide a unique source of inspiration and ideas for the design. This will take active engagement and collaboration between departments and by combining this with views from the

Below:  
Temporary  
displays can  
also be used for  
education





Left: Healthy Herbie: a plant bed in the shape of a person! Each plant is positioned in the bed in relation to the part of the body it is used to treat

wider external audience can only enhance the future of botanic garden plant collections, their purpose and enjoyment.

We all want to succeed at what we do and when an idea has been well thought out, planned and developed we are not only benefiting our work but the gardens as a whole. We may also become recipients of awards such as with Sydney. Long may such educative display ideas continue to grow and develop in your garden!

## ▲ Resumen

La tradición des collections de plantes comme support d'éducation pour le public est aussi ancienne que l'origine des jardins botaniques eux-mêmes. Aujourd'hui, les jardins botaniques à travers le monde présentent leurs plantes vivantes, ayant valeur scientifique, de conservation ou esthétique selon les savoir-faire. Cependant, nos jardins contiennent quelques exemples de présentations spécifiquement conçues pour l'éducation. En tant qu'horticulteur passionné par l'éducation du public sur les plantes, je pense que les jardins

botaniques peuvent aller plus loin dans leur rôle éducatif primordial en introduisant des plantations conçues spécifiquement pour l'éducation. Les bénéfiques sont nombreux, depuis l'enrichissement de l'expérience des visiteurs jusqu'à l'amélioration de la promotion du jardin. Pour y parvenir avec succès, il faut travailler en équipe avec les différents services, en définissant ce que nous essayons d'accomplir et en l'intégrant dans le rôle du jardin et le plan d'ensemble. Peut-être devrions-nous être plus vigilants, en ne disant pas *planter pour l'éducation*, mais *planifier pour l'éducation* ?

## ● Resumé

El uso tradicional de las colecciones de plantas como un medio para que la gente aprenda sobre las plantas es un método que tiene su origen en los comienzos de los propios jardines botánicos. Hoy, los jardines botánicos de todo el mundo exhiben sus colecciones vivas de plantas de valores para la ciencia, para la conservación y estéticos de la mejor forma posible. Sin embargo, nuestros jardines contienen pocos ejemplos de

exposiciones diseñadas específicamente con fines educativos. Como horticultor con entusiasmo para educar a la gente sobre las plantas, creo que los jardines botánicos pueden desarrollar aun mas su papel para educar a la gente sobre las plantas al incorporar diseños creados específicamente con este fin. Los beneficios son numerosos, desde mejorar la experiencia para el visitante hasta aumentar la promoción del jardín. Para alcanzar esto se tiene que partir con la colaboración entre departamentos, definiendo que es lo que estamos tratando de conseguir e incorporando esto dentro del papel y el plan general del jardín. ¿Tal vez sea necesario darle más atención no tanto al plantar para educar, sino al planificar para educar?

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Joyaux des Caraïbes

Las Joyas del Caribe

# Jewels of the Caribbean

## ■ Summary

The new 12-acre Jewels of the Caribbean exhibit at Fairchild Tropical Garden will connect visitors to the natural heritage of the region and interpret environments that are found in both South Florida and other areas of the Caribbean Basin. Habitats included in the exhibit are the pine rocklands, currently under development, a xeric landscape, palm savanna, humid forest, seasonally dry forest and mangrove. These habitats and many native species in them are threatened or endangered. Jewels of the Caribbean will highlight Fairchild research and conservation projects in the region, encourage visitors to explore the unique characteristics of each habitat, and will become a living classroom for children and adult learners.

## Introduction

Planning and planting the new Jewels of the Caribbean exhibit at Fairchild Tropical Garden with education in mind, involves new and traditional partners in the process. For many visitors, the environments of the Caribbean region are appealing but not well understood. More than 50 percent of the population living in largely urban South Florida has its origins in the nations of the Caribbean region. Other residents come from temperate regions of North America and elsewhere. Jewels of the Caribbean will provide visitors with information that will link the people and plants of South Florida to family and botanical roots in the Caribbean. The focus on regional ecology and ethnobotany can increase community understanding of the Caribbean region and inspire positive actions toward threatened ecosystems.

Jewels of the Caribbean will feature six habitats and is part of a larger, Caribbean Biodiversity Program at Fairchild Tropical Garden. Habitats included in the exhibit are the pine rockland, a Xeric coastal community, palm savanna, humid forest, dry forest, and mangrove. These habitats and the many native and endemic species in them are threatened or endangered. The Caribbean region is a hotspot that encompasses the islands in the Greater Antilles (Cuba, Hispaniola - which includes the Dominican Republic and Haiti - Jamaica, and Puerto Rico), and the Turks and Caicos. It also includes the Lesser Antilles and the southern tip of Florida, namely the Everglades and the Florida Keys.

Interviews conducted at Fairchild indicate that visitors would like more information about the plants they see at the Garden and that local residents want to learn which plants can be successfully cultivated in their home gardens. In meeting the needs of visitors for information about the collections and plant cultivation, there is an opportunity to address larger ecological concerns. Exhibit development for Jewels of the Caribbean is proceeding on two fronts:

- designing and planting the habitats
- increasing participation in exhibit development.

Strategically placed panels around the Jewels of the Caribbean site provide a visitor orientation to exhibit elements under development now, and what is to come. The panels identify the Caribbean region, illustrate ecological features common to the islands, and introduce the six different representative habitats to be developed. Visitors learn about the 25-

member Caribbean Botanic Gardens for Conservation Network, of which Fairchild is a member, and its goals for research, conservation and education. A panel introduces the 'hotspot' concept (biologically rich areas with high diversity and a large percentage of endemic species) explaining that the original Caribbean hotspot area once extended over 250,000 square kilometers. Today, there is only around 11% of the total original vegetation left in this hotspot, with 41,000 sq. kms under protection. There are 12,000 species of plants in the Caribbean hotspot, of which more than 50% are endemic. In each of the habitats, interpretation will include island biogeography, ecological diversity, species diversity and distribution, plant/animal interactions, traditional uses of plants, influences of plants on culture, endangered species and threatened habitats, and biodiversity conservation. Jewels of the Caribbean

Right: Green Treasures is a four year project developed to engage middle school students in learning about plants native to South Florida and the Caribbean. Here students are gathering ethnobotanical information for use in exhibit interpretation  
Photos: Eva Doll/Fairchild Tropical Garden





Left: Tom Hedges and Tom Greenwood, interns from RBG Kew with Don Evans, Director of Grounds Management, discussing the landscape plan for the Pine Rockland exhibit



will highlight Fairchild research and conservation projects in the region. Self-directed activities and volunteer interpretive guides will encourage children and adult visitors to explore the unique characteristics of each habitat.

### Planting the habitats

The first Jewels of the Caribbean habitat to be planted and interpreted is the pine rockland. Visitors to this exhibit will be able to identify species in this unique plant community and will understand why the pine rockland is a disappearing Caribbean Jewel. This

exhibit in a garden setting will attract visitors who otherwise would not seek out a pine rockland environment to explore. The pine rockland habitat will invite access and provide interpretation designed to attract the casual visitor with informal education opportunities. Developing the landscape design and interpretation for the habitat is a team of horticulturists, a conservation biologist, an educator, an interpretation coordinator and graphic designer. Meetings are open and other staff often join the team to add expertise on specific issues such as current Fairchild research and conservation projects, accessible interpretation for persons with disabilities, marketing the exhibit to visitors, and making the habitat user-friendly for school groups. The pine rockland habitat will have a mulch path winding among tall pines (*Pinus elliottii*), that will form a canopy over palms (*Sabal palmetto*), and other understory species. The design of the habitat will invite school groups to explore the disappearing pine rockland, identify species and understand the ecology of the habitat. Characteristics

that make the pine rockland unique such as endemism, diversity, and human use will be demonstrated. Ecological concepts including loss of wilderness, habitat dynamics such as fire and hurricanes and the role of conservation and research activities will be illustrated.

### Community participation

The target audience includes people from local Miami-Dade County Caribbean ethnic communities, students, families, Garden members and the casual visitor. It will take time for the habitat landscapes to be completed and for plants to grow, but students and community members are already participating in Jewels of the Caribbean activities. Green Treasures, a four-year project funded by the Howard Hughes Medical Institute was developed to engage middle school students in learning about plants native to South Florida and the Caribbean and to gather ethnobotanical information for use in exhibit interpretation. This exhibit development

Left: Older members of the community hold valuable information about traditional plant uses. Through interviews this information can be documented and shared with the wider community  
Photo: Eva Doll/Fairchild Tropical Garden

Right: Documenting local ethnobotanical knowledge can help to increase community understanding of the Caribbean region and inspire positive actions towards threatened ecosystems  
 Photo: Eva Doll/Fairchild Tropical Garden



model focuses on the strong connections between the people and plants of the Caribbean region through family and intergenerational informal science learning. In a partnership with the Foster Grandparents Program of the Public School District, students interview older adults of Caribbean origin about traditional plant uses. The stories told through the voices of the elders and students are recorded and archived. Teachers participate in workshops to learn about Caribbean Basin plants and environments and the science that explains the selection of particular plants for use by people. Students engage in informal learning activities designed to support student achievement of required science standards. In a visit to Fairchild, students participate in one of four guided field studies to:

- Learn to use a dichotomous key while getting to know native plants and their uses;
- Discover how plants adapt to different environments;
- Discover trees that are useful for the people of South Florida and the Caribbean;
- Learn about plant families.

As the habitats develop, the learning opportunities will include exploration, cultural activities and other programs.

The Plant Mobile, a vehicle that extends *Green Treasures* outreach to students at their schools, expands the number of participating students and extends learning to schoolyard ecosystems. During the Plant Mobile school visits, students:

- Learn about Kingdom Plantae, from simple mosses to complex flowering plants;
- Identify native and invasive species and discover local ecology;

- Discover "through supermarket botany" where food plants originated, make plant dyes and test for starch.

These activities are interdisciplinary and can be used to prepare students for a visit to Fairchild, a natural area or to investigate the ecology of their school yard or home garden.

### Conclusion

Jewels of the Caribbean exhibit began with the development of the theme and design of the landscape. In addition to conducting surveys of members and casual visitors, the exhibit development process included gathering information from the Caribbean ethnic communities, students, and intergenerational groups. Jewels of the Caribbean will celebrate the beauty and diversity of species and communicate the conservation role of the botanical garden. By increasing participation and education during the development phase, Jewels of the Caribbean can become an exhibit that contributes to positive attitudes and actions toward threatened ecosystems of the Caribbean region.

### ▲ Resúmen

La nouvelle exposition « Joyaux des Caraïbes », d'une surface de 4,8 hectares dans le Jardin Tropical Fairchild, mettra le visiteur en contact avec le patrimoine naturel de sa région et interprétera les environnements que l'on peut trouver dans le Sud de la Floride et dans les autres parties du Bassin des Caraïbes. Les milieux naturels présentés dans l'exposition sont les zones rocheuses à pins, actuellement en cours d'aménagement, un paysage aride, une savane à palmiers, une forêt humide, une forêt sèche saisonnière et une mangrove. Ces milieux et les nombreuses espèces indigènes qui les habitent sont menacées ou en danger. Joyaux des Caraïbes mettra en lumière les recherches effectuées à Fairchild et les projets de conservation menés dans la région, encouragera les visiteurs à découvrir les caractéristiques exceptionnelles de chaque milieu et deviendra une école vivante pour l'apprentissage des enfants et des adultes.

### ● Resúme

La nueva exposición del Fairchild Tropical Garden, llamada Las Joyas del Caribe, y que cubre unas 4.8 hectáreas, pondrá en contacto a los visitantes con el patrimonio natural de la región e interpretará el medio común del sur de Florida y el resto del Caribe. Los hábitats incluidos in la exposición son los roquedos de pinares, actualmente bajo construcción, un paisaje desierto, savana de palmeras, bosque seco estacional, y manglares. Estos hábitats, y muchas especies autóctonas dentro de ellos, están amenazados o en peligro. Las Joyas del Caribe destacará la investigación en Fairchild y los proyectos de conservación en la región, animará a los visitantes a explorar las características únicas de cada hábitat, y será un aula viviente tanto para la enseñanza de adultos como para los niños

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Faire passer le message par l'intermédiaire de...

Transmitiendo el mensaje...

# Getting the **message** across...

## ■ Summary

The Eden Project wants people to value plants and to realise their inter-dependence on them. Every plant has a purpose, some are the star attractions, others of more practical merit. The diverse landscape plantings are designed to draw one around the site. The critical feature of exhibit plantings is scale. Important crops of the world are seen in a crop setting, a field of hemp, a plantation of cocoa, etc. Some plants are incredibly common, such as potatoes and maize. These have important stories too, including plant diversity and sustainability. The stories are told through numerous forms of interpretation with the hope of educating, inspiring, exciting and challenging the visitors.

## Introduction

There are so many incredibly important things to say about plants. There are issues surrounding biodiversity, sustainability, genetic engineering, intellectual property rights of indigenous



people, etc. Where in the world does one begin? At the Eden Project we focus on these issues in a variety of ways and in different places.

The Eden Project opened in 2001 and is one of the UK's millennium funded projects. It has utilised and redeveloped one of the lifeless china clay mining pits in Cornwall. Within the pit three biomes have been created: a temperate biome, warm temperate biome and humid tropics biome. The latter two biomes are enclosed inside domes in order to control their conditions. Plants from those regions of the world are showcased in order to highlight the often overlooked importance of plants in our lives. So how do we get this message across? Well, the Eden Project strives to get visitors thinking. Through our interpretation we aim to trigger thoughts such as:

### Wow!

Aren't these plants **great!**

What are they **for?**

Why do I need plants?

So who's going to **look after** them?

**What am I going to do to help?**

This is no short order! Messages are conveyed using diverse techniques including sculpture, music, play, signage, paintings, guided tours, books, presentations, workshops etc. The stars of the show are of course the plants themselves. They are chosen first and the plantings are then designed to work with different methods of interpretation.

The key thing about the plants is that each and every one has a purpose. If it doesn't, it doesn't make the grade. The purposes vary enormously. For some plants, such as the cashew nuts (*Anacardium occidentale*), the lavenders (*Lavendula x intermedia* 'Grosso') or the



Left: The sinuous lines of the outdoor biome draw people around the site

olive trees (*Olea europea*), they themselves are the focal points in a story. Occasionally it is a group of plants that tell a story. For example, the endemic plants from St. Helena demonstrate the vulnerability of island ecology and a group of plants representing myths and folklore reveal the wide spread use of plants in folklore. For other plants though their purpose may be a little harder to decipher – soil stabilisation, screening, ground cover, shading etc.

In the outdoor landscape there are areas of structural planting. These areas create the patterns, forms and symmetry of the site. They give the site a modern flowing feel. They provide a pleasant green background to the more 'exciting' exhibit plantings and encourage visitors to explore areas of the pit by drawing them out and about with the interesting shapes and odd splashes of colour. Many of the plants used in these areas wouldn't normally fit the description of 'landscape plant'. This helps to give the pit its unusual feel. For example, swathes of Cornish palm (*Cordyline australis*), African Lilies (*Agapanthus*), Calla lilies (*Zantedeschia aethiopica*), *Canna*, *Pittosporum* and *Drimys* are but a few. Specimen trees and vast extents of semi-mature hedging create a sense of scale and we hope will soon provide a level of maturity to the outside biome. Plants such as Camellia (*Camellia alba*

Left: The stars of the show at Eden are the plants!

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Right: Flags create interest and colour even on the bleakest of days



*simplex*) and Bay (*Laurus nobilis*) are used for hedging while Holm oak (*Quercus ilex*) has been pruned to create the image of a 'lawn'. As time progresses, these plants will grow to provide intimate areas within the vast and incredibly busy landscape.

It is obvious that many of the plants used are selected for their appropriateness to the mild temperate climate of the Cornish peninsula. We are exceedingly lucky, and indeed the site was chosen for the mild winters and the vast range of plant species that can survive here without protection.

Crucially, large numbers of plants are used throughout. How can one lonely cocoa (*Theobroma cacao*) tree reflect the plantations of West Africa? How can one cocoa plant be used to illustrate the oppressive work involved in growing and harvesting the crop and the injustices experienced by workers on plantations? How can one coffee (*Coffea arabica*) plant provide enough beans to show visitors how they are processed? How can school children learn how to make paper without a large supply of papyrus stems? They can't. It was decided long ago to represent these immensely important plants in a scale that reflects their importance. Even so, additional crops are grown off site to ensure there is ample supply for all the educational needs.

Equally, a number of the plants at the Eden Project are very common. This is definitely no lack of commitment on the plant procurement front. Visiting folk need a breather, the really interesting is dotted throughout the less interesting. Even so, the intent is to create interest in plants and ecotypes that many people consider boring. After people have explored, been engaged, excited and even challenged by the issues and diversity of the towering rainforests and dusty warm temperate regions they can

step outside and see with fresh eyes the incredible diversity and issues on their own doorstep. The exhibit 'Wild Cornwall' brings to life problems facing our very own endangered plants here in Cornwall. The plants are interspersed with poems and sculpture highlighting critically affected plants. Crops such as potatoes show plant diversity. Swathes of crops such as flax, soya and maize talk about the future of plant materials in bio-composites, oils and starch based plastics for a more sustainable future.

So in short, how does Eden educate? By using a range of techniques to engage minds of all ages and wants. By not being afraid of being different, being common, being artistic, being zany or simply having a lot of everything!

## ▲ Resúmen

Eden souhaite que les visiteurs évaluent la valeur des plantes et prennent conscience de leur dépendance vis à vis d'elles. Chaque plante a un objectif, certaines sont des attractions-phare, d'autres ont des intérêts plus pratiques. Les différents paysages reconstitués sont conçus pour que le public puisse en faire le tour. La caractéristique de cette présentation est son échelle. En effet, les cultures d'importance mondiale sont présentées dans une reconstitution de champs, un champ de chanvre, une plantation de cacao etc. Certaines plantes sont extrêmement courantes, telle que la pomme de terre et le maïs.

Elles ont aussi des histoires importantes à raconter, tel que la biodiversité végétale et le développement durable. Les histoires sont racontées au moyen de nombreuses formes d'interprétation, dans l'espoir d'éduquer, d'inspirer, de stimuler et de défier les visiteurs.

## ● Resumé

El proyecto Edén quiere que la gente valore a las plantas y que comprenda su dependencia con ellas. Cada planta cumple un propósito. Algunas constituyen atracciones estelares, otras tienen un mérito más práctico. El diseño paisajístico tiene el propósito de llevar al visitante a través del lugar. Un factor crítico del paisaje es la perspectiva que se le da. Plantas de importante valor económico se ven en su propio medio - un campo de cáñamo, una plantación de cacao, etc. Algunas plantas son increíblemente comunes, tales como las patatas y el maíz. Estas tienen también una importante historia, incluyendo la diversidad de las plantas y la sostenibilidad. Las historias se relatan a través de numerosas formas de interpretación con el propósito de educar, inspirar y estimular y desafiar a los visitantes

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Right: An African roundabout within a rainforest clearing



Concevoir et développer des jardins pour enfants

Diseñando y desarrollando jardines para niños

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# Designing and Developing Children's Gardens

## ■ Summary

Children's gardens are becoming increasingly popular within public gardens. Developing a children's garden begins with a clear understanding of visitor's needs and institutional goals, and can end with any of several models. Generally these models fall into one of two categories: exploration spaces designed and cared for by adults or gardens planted and maintained by children. There is a great deal of design diversity within children's gardens, but a well-designed garden will meet educational goals while serving as a model of sustainability. This article examines the essentials that go into producing and running a successful children's garden while arguing the need for core principles such as water conservation and focusing on native plants to be incorporated.

Children's gardens have served as vehicles for education since at least the 19th century in Europe (Shair, 1999). In the United States, the first children's garden within a public garden opened at the Brooklyn Botanic Garden (BBG) in 1914. Children's gardens serve as social gathering spaces, school campuses, play areas, and learning zones where every subject from history and literature to physics and psychology have real-world application. For example, school gardens in the USA sometimes take on a "three-sisters" theme, which focuses on corn, beans, and squash (the three sisters) and their historic importance to Native Americans. In 2002, the BBG Children's Garden included a set of trellises built by children using the design principles of Buckminster Fuller (see [www.bfi.org](http://www.bfi.org)). In 2003, BBG plans a series of



Left: An instructor in the BBG's Children's Garden helps children answer their questions about cauliflower  
Photo: Ben Russell

interactive planter boxes dedicated to plants and symbolism -a view of how people around the world have attached larger cultural meanings to specific plants.

Children's gardens, when well designed, not only meet educational goals for sustainability but are themselves sustainable—socially, environmentally, and programmatically. To the public, locally native plants, organic fertilizers, and integrated pest management may be the most visible aspects of sustainable gardening. Less obviously, children's gardens can serve to break down social barriers; at BBG, the Children's Garden Program is attended by members of many different communities who may not otherwise interact with each other outside the program. Friendships are formed through cooperation and work toward a common goal (having a successful garden.). Programmatic sustainability is also important: a children's garden is a long-term endeavor. It is important to plan, not

just for the year ahead, but for five, ten, or fifteen years of gardening. This allows the garden to develop, over time, a multi-generational program that builds on the previous experience of participants. The long-term view is also important to consider when looking at staffing and funding sources.

Within public gardens, children's gardens have taken numerous forms but generally fall into one of two categories: exploration spaces designed and cared for by adults or gardens planted and maintained by children.

Exploration spaces such the Discovery Garden at BBG and the Michigan State University 4-H Children's Garden are typically designed and cared for by professional horticulturists. Depending on the garden, children may contribute design ideas, volunteer with special gardening projects, or participate in hands-on activities. In these gardens there is a focus on experiential



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learning, with plants for touch, smell, and exploration. There is often an intergenerational component, with whole families learning together.

Right: Exploration of plants and gardens can be the beginning of scientific inquiry

Photo: BBG

Below Left to

Right: A young gardener releases ladybugs to keep the aphid population in check

Photo: Ben Russell

Wide pathways and bright colors

encourage children to explore on their own or with their families

Photo: BBG

Large touchable topiaries encourage the imagination-

every child will take away their own special meaning from this garden

Photo: Helena Fierlinger

Gardens planted and designed by children may function as community gardens for families, as children-only areas for individual youth, or as school gardens in partnership with a teacher, school, or school district. The 0.4 hectare (one acre) Children's Garden at BBG is attended by almost 1000 registered children annually, with each participant returning for multiple visits through the year. Children register for the experience of gardening, and re-register to be with friends and see their garden through the full year of growth. Some children return every season, and some return each year for as many as eight years before eventually becoming Junior Instructors in the program. In gardens where visitation is not restricted to registered gardeners, the numbers may be much higher. A survey across six European countries showed that 'children's city farms' of one hectare (2.5 acres) may have as many as 60,000 visitors annually. (Ginsberg, 2000). Again focusing on direct experience, these gardens offer children responsibility and decision-making opportunities as well as a tangible reward in the form of a harvest.

The experience of an individual child within a children's garden (of either type) is directly related to that individual's previous personal experiences, the social context in which they are present, and the physical space provided (the garden)

(Falk and Dierking, 2002). As horticulturists, garden designers may tend to focus on the physical space, but the design of a children's garden should take each of these points into consideration. It is especially important to think about the social context of your visitors: at BBG, small cohorts of children who have become friends through the Children's Garden program motivate each other to return yearly. In other gardens, the primary social context may be school- or family-based; breaking up these groups into 'manageable sizes' for programming purposes may sometimes be necessary, but it will have an impact on the learning process.

**Who is the garden for?**

Wide pathways are important for accessibility and provide room for families and school groups to navigate and gather for impromptu discussion; narrow twisting pathways invite exploration by individuals and games for small groups. If school groups will be attending, be sure that major pathways are wide enough to accommodate two groups passing each other—at least 2.5 meters. It is also important to have space set aside for groups to gather, either as a class, as families, or as small clusters of individuals. Also important for accessibility are smooth, gentle slopes (where necessary) versus stairs, access to water fountains for drinking, and raised planter boxes for people in wheelchairs or for those who may have trouble bending. Raised planter boxes can also help control the flow of traffic in the garden (and keep plants



from being trampled) if you anticipate large crowds or school groups.

**Why will children come to the garden?**

A visit to a children's garden may be extrinsically motivated (by a school teacher or a desire to please a parent, for example) or intrinsically motivated by a desire to have fun or spend time with friends. If students will be attending your garden because of a mandate from a teacher or other adult, be sure to help meet teachers' expectations with the resources they need to help children make connections back in the classroom. If children and families will be visiting more informally, remember that the garden is an exhibition space and, like any children's exhibit, will thrive on interactivity and change. An exhibit in a children's science center may have a life span of only a few months or years—it is important for at least some elements of your garden design to be just as flexible. Interactive displays with changing foci from season to season may also help to increase repeat visitation.

**What type of programming will there be?**

Unfacilitated visits stress the exhibit-like nature of a garden. Signs, symbols, and sounds can help as interpretive tools. Drop-in workshops require more staff time but also allow guided facilitation. Registered classes may include one-time or ongoing visits by school groups, families, or other groups. Once children come to the garden, will they return? Designing programming in an ongoing series or programs that change regularly will help to ensure repeat visitation, which is important for informally conveying key concepts related to change and





connectedness over time. A second, third, or tenth visit may be the occasion when previous experiences come together into a new realization. Allowing children to experience a garden through multiple seasons or years can also drive home the message of sustainability.

### What are your educational goals?

A children's garden may focus on a few specific educational goals, such as the life cycle of a butterfly or the role of pollinators. At the other end of the spectrum, a garden may have no direction, no interpretation, and a focus on visitors constructing their own meaning based on prior knowledge and their current experience in the garden. Specific educational standards in almost any subject can be supported with the right combination of plants and interpretation, but be sure to think past the current exhibit. Tightly focused exhibits may work well in a structured situation with specific curriculum ties, but for the general public their appeal will be short-lived.

Whatever your participating population and garden design turn out to be, there are some core principles that can apply across any garden design. Sustainable gardening principles, including water conservation, seed saving, integrated pest management, and focusing on native plants, can serve as an underlying structure or as interpretive themes in their own right, and effectively double the impact of your garden by modeling methods that you hope the public will adopt.

Through a series of interviews with participants, a recent study of the Children's Garden at the Brooklyn Botanic Garden identified seven themes that run through the garden

program. Instilling a love of nature, learning by doing, acquiring self-reliance, age appropriate gardening, attaining an understanding of the living world, getting dirty, and gardening parents were all identified as important themes (Blandford, 2003). Some of these themes were anticipated by staff during planning, but others, and the actual experiences of individuals in the garden, were not. Ultimately, a new children's garden will take on a life of its own that will reflect the plants and people that are present.

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### ▲ Resúmen

Les jardins pour enfants deviennent de plus en plus populaires au sein des jardins publics. Développer un jardin pour enfants prend appui sur une bonne connaissance des besoins des visiteurs et des buts de l'institution et peut aboutir à un modèle parmi d'autres. En général, ces modèles sont répartis en deux catégories : des espaces d'exploration conçus et entretenus par des adultes ou des jardins plantés et gérés par des enfants. Il y a une grande diversité de conceptions parmi les jardins pour enfants, mais un jardin bien conçu doit

allier les objectifs éducatifs tout en étant un modèle pour le développement durable. Cet article analyse les points essentiels à respecter pour produire et développer un jardin pour enfants réussi, en insistant sur la nécessité de respecter des principes fondamentaux, tels que la conservation de l'eau et en mettant l'accent sur l'utilisation des plantes indigènes.

### ● Resumé

Los jardines para los niños se van haciendo más y más populares dentro de los jardines públicos. El desarrollo de un jardín para niños comienza con una clara visión de las necesidades del visitante y de los objetivos de la institución, y puede llevar a cualquiera de varios modelos. Generalmente estos modelos corresponden a una de dos categorías: espacios para explorar diseñados y cuidados por adultos, o los jardines plantados y mantenidos por los niños. Hay gran diversidad en el diseño de un jardín para niños, pero un jardín bien diseñado conseguirá los objetivos educativos y a la vez será un modelo de la sostenibilidad. Este artículo examina todo lo que es esencial en el diseño y la gestión de un jardín para niños que este consiguiendo sus propósitos, pero a la vez se hace hincapié en que no debe olvidarse la necesidad de incorporar tales principios claves como son la conservación del agua y la importancia de las plantas autóctonas.

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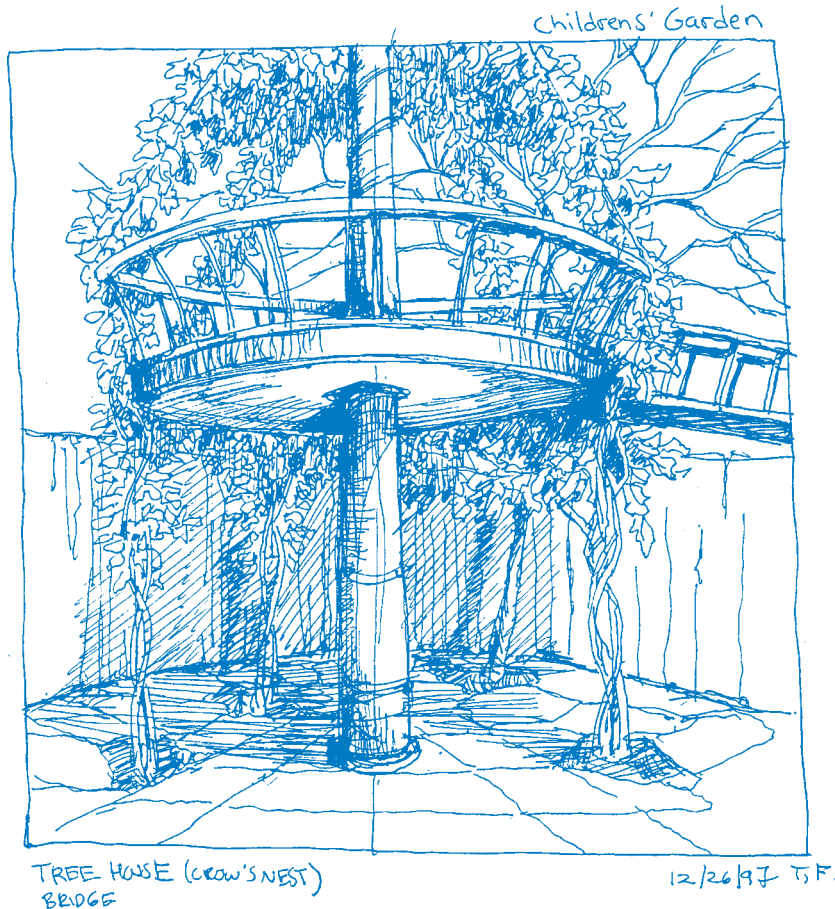
Top Left:  
Gardeners have  
been tending  
their own plants  
in the Brooklyn  
Botanic Garden  
Children's  
Garden since  
1914  
Photo: Robert  
Maas

Visions protéiformes et Rêves plastiques : concevoir un jardin pour enfants

Visiones y sueños - diseñando un jardín para los niños

# Protean Visions and Plastic Dreams: Designing A Garden for Children

Right: The new Children's Garden will excite kids about visiting and being in gardens



## ■ Summary

Longwood Gardens built one of the first public children's gardens in the United States. Staff are currently approaching the design of the new children's garden (anticipated to open in 2006) in an innovative manner. The design process is emphasizing the aesthetic, sensual, and engaging (mental and physical) aspects of spatial experiences.

Longwood wants children to learn the joy and relevance of plants and horticulture through fully being in a garden. Educational and interpretive goals are secondary. In short,

Longwood seeks to create a world-class garden based upon Longwood's unique identity and drawing upon the history of gardens in general.

## Introduction

Longwood Gardens is an internationally acclaimed display garden combining horticulture, design, fountains (water effects), education, and the performing arts into an extraordinary experience. Longwood captivates the senses and imaginations of almost one million people per year who visit the Kennett Square, Pennsylvania, property. Families and children are crucial groups of visitors.

Staff are currently in the process of designing a new indoor Children's Garden anticipated to open in 2006. Longwood is developing the design, learning opportunities, and interpretation completely in-house. Staff have identified innovative themes for generating a compelling garden grounded in Longwood's unique identity and history but applicable to any institution.

## Pierre Samuel du Pont (1870-1954) and Longwood Gardens

Pierre Samuel du Pont, industrialist, engineer, philanthropist, and amateur landscape gardener purchased the land on which to develop his horticultural vision in 1906. The following three decades witnessed the evolution of the estate – the creation of a neoclassical conservatory, glass growing houses, extensive fountains, and diverse garden spaces.

Pierre and his wife Alice Belin du Pont (1872-1944) used Longwood as a stage for social activity, continually offering their hospitality to family, friends, and business associates. Pierre and Alice had no children of their own but were particularly fond of their many nieces and nephews who found a magical and ever-changing world within the gardens.

## A continuity of children's gardens

Longwood's Children's Gardens have built upon Mr. du Pont's example of welcoming children into a fantastical and stimulating realm of plants and water features. All have offered enticements 365 days of the year thanks to a glasshouse setting. Longwood built its first Children's

Garden in 1987. Staff intended the garden to be temporary, but popular response suggested that the garden become a permanent feature. Staff then designed the second Children's Garden in 1989. This garden delighted visitors from April 1990 until January of 2003 when the conservatory wing housing it and the adjacent East Conservatory closed for renovation.

Staff began the planning and design for the third children's garden in 1997. The new garden will encompass an entire conservatory wing, making it three times as large as the original. An in-house design team immediately began brainstorming and rethinking what a children's garden at Longwood – or anywhere – could and should be.

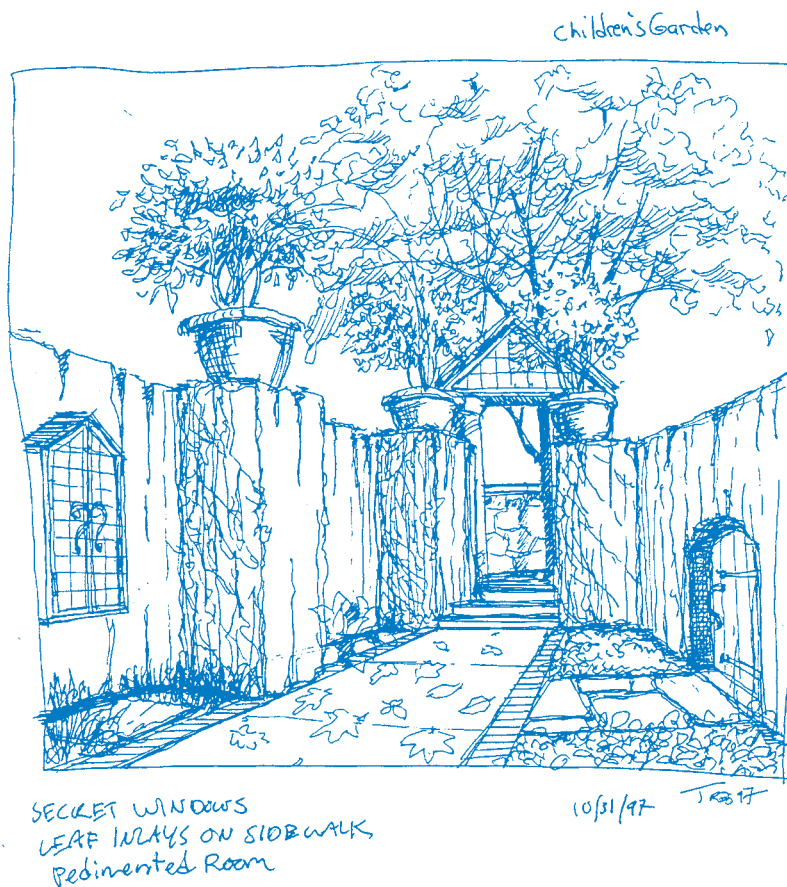
The team began by visiting children's gardens in the United States, attending the American Horticultural Society's annual Youth Gardening Symposium, speaking with colleagues, and holding focus/discussion groups.

### A new garden, a renewed vision

The design team discovered a missing element in the children's gardens they explored and in the thinking of their colleagues. The idea of the garden was missing.

They noticed the seemingly obvious: the successful elements of a garden for children are the same elements contained in successful gardens (designed for adults) throughout history. Children's gardens differ in their scale. One should simply (but there is nothing simple about it) design a well-conceived, detailed, and constructed garden. The design team decided merely employing the trappings and adopting the symbols of a recollected idea of 'childhood' was not the answer for Longwood. Illustrating storybooks in topiary was a bit facile. Decorating exhibits on photosynthesis with plantings wanted for charisma. Replicating tried and true 'cookie cutter' elements monotonously appearing in most children's gardens lacked conviction.

The seductive challenge became how to create something appealing yet able to pioneer new directions. During the



Left: Engaging youngsters at the start of a life-long relationship with gardens is critical for the future of public gardens

design process and research the core design team articulated several principles to guide the new garden in all its parts. They continuously revised the concepts as both their thinking and the physical design evolved.

### Offer aesthetics instead of academia

The design should create a world-class garden experience. Interpretation and blatant educational messages should be secondary to aesthetic concerns. The spaces, plants, and physical and mental delight of being in a garden environment should themselves be the message. Instead of an outdoor museum exhibit surrounded with plants, Longwood should create a true garden containing teachable moments as an integral part of its scheme.

### Emphasize sensuousness over syllabi

The new Children's Garden should excite kids about visiting and being in gardens, particularly public gardens. Children should discover the ever-changing, richly-layered experiential, horticultural, social, aesthetic, and

imaginative offerings within a well-designed garden. Engaging youngsters in the beginning of a lifelong relationship with gardens is critical for public gardens' futures. Children are the future supporters and visitors of every horticultural institution.

### Create spaces before decorations

The design should primarily offer compelling, sensuous, horticulturally exuberant, experientially rich spaces, in other words, gardens, for children. An excitingly choreographed series of spaces should be the garden's foundation.

Staff were interested in the types of spaces (not just garden spaces) children enjoyed and in what children did in the spaces (not just gardening activities). The linkages, sequences, and quality of spaces should engage kids physically and mentally. The aesthetics (how things looked), though important, should be almost a decorative overlay over the rooms, tunnels, caves, groves, etc. After all, kids are quite content to play in cardboard boxes if the boxes engage them.

### Leave the story untold or suggest the briefest of outlines

Children should encounter no obvious pre-existing stories or themes (e.g. Mother Goose, Peter Rabbit). Such themes might limit the garden's appeal and legibility because not everyone might know (or have cultural access to) the stories. Staff designed so children could engage the garden by making up their own stories based on the possibilities contained within and suggested by the spaces.

### Be true to the organization's identity, purpose, and history

Longwood's garden should combine Mr du Pont's two great passions, plants and water effects, with his devotion to children. Staff would thus base the garden solidly within Longwood's overall identity and mission. The design should also draw aesthetic inspiration from the sources Mr du Pont drew - classical garden imagery, spaces, and horticultural theatricality. The Children's Garden, in short, should be an intensification and condensation of the overall Longwood experience.

### Rethink the entire institution as a children's garden

Education staff suggested that in addition to designing a specific garden for children, Longwood should also plan and design ways to open the entire institution to children. The Children's Garden should then provide a climax within an already intriguing and satisfying visit. Children should come to claim Longwood in its entirety as their own.

Longwood in no way intends these principles as a set of rules or methodology. The design team has followed them as a flexible, yet inspiring, framework. The true test of the concepts will occur once the garden opens in 2006. Longwood looks forward to sharing both the garden and future lessons learned with the public garden community.

### ▲ Resumen

Les jardins de Longwood ont mis en place un des premiers jardins publics pour enfants des Etats Unis. Les responsables ont une approche très innovante pour la conception du

nouveau jardin pour enfants (ouverture prévue en 2006). Le processus de conception englobe l'esthétique, le sensoriel et inclut les aspects physiques et mentaux de l'expérience spatiale.

Longwood veut que les enfants apprennent le plaisir et la pertinence des plantes et de l'horticulture en étant physiquement dans le jardin. Les buts éducatifs et d'interprétation sont secondaires. En résumé, Longwood cherche à créer un jardin de niveau international basé sur l'identité exceptionnelle de Longwood et traitant de l'histoire des jardins en général.

### ● Resumé

En los jardines de Longwood se construyó uno de los primeros jardines públicos para niños en los EEUU. El personal ahora está diseñando de manera novedosa el nuevo jardín de los niños (que se propone inaugurar en 2006). El proceso de diseño le da hincapié a los aspectos estéticos, sensoriales y atractivos mental y físicamente de las experiencias espaciales.

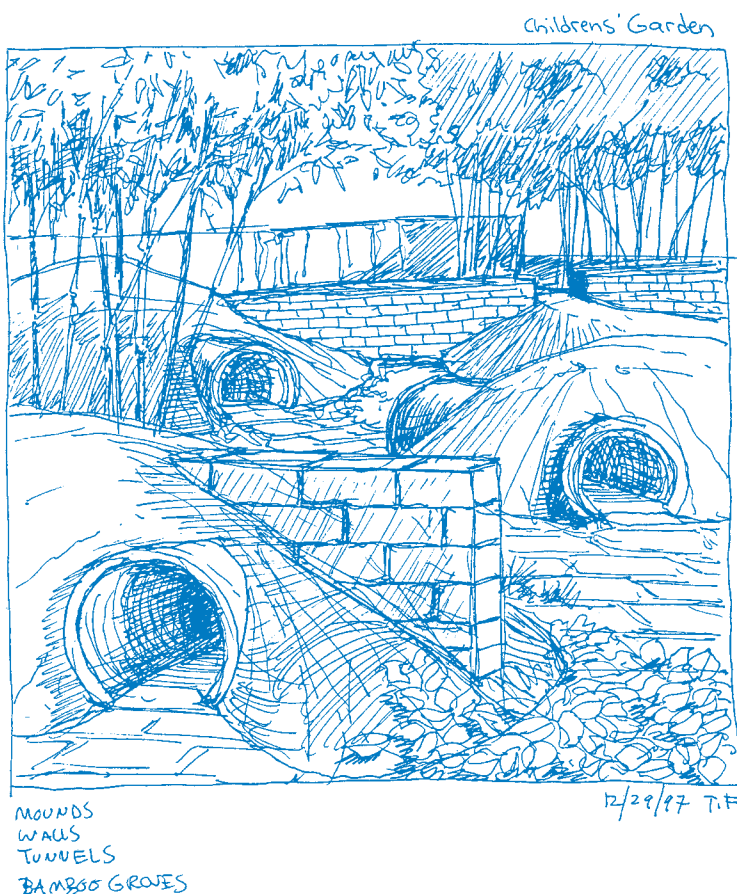
Longwood desea que los niños comprendan la alegría y la pertinencia de las plantas y la horticultura estando físicamente en un jardín. Los fines educativos e interpretativos son secundarios. En resumen, Longwood intenta crear un jardín de prestigio mundial partiendo de su exclusiva identidad y utilizando la historia de los jardines en general.

### Acknowledgements

→ The author would like to acknowledge the essential contributions of Mary Allinson, Sharon Loving, Betsey Ney, and Fred Roberts in developing the approach and philosophical framework described in this article.

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Right: Rooms, tunnels, cages and groves will captivate kids physically and mentally



# Native Trees

## – Roots of Life

### ■ Summary

Most people, including local residents, generally perceive Hong Kong as a concrete jungle and have little awareness of the threats facing our native flora & fauna. Here at Kadoorie Farm and Botanic Garden (KFBG) we have set up an education project entitled 'Native Tree – Root of Life' to help students discover the ecological and cultural link between native trees and ourselves. Through the learning process, secondary students can gain inspiration from and re-connect themselves with the natural world. Through encouraging students to participate in planting native trees, we aim to restore Hong Kong's forest ecosystem, so echoing the vision of a Chinese proverb:

**If you have one year, plant crops.  
If you have ten years, plant trees.  
If you one hundred years,  
educate humanity**

Despite having a land area of just 1,074 sq.kms, Hong Kong has 390 native tree species. Although they have a significantly higher ecological value than exotic trees, their application in afforestation and landscaping is hindered by insufficient research and a lack of supply of seedlings.



Left: Feng Shui woods and a village

Propagation techniques for exotic trees have been well studied and are readily available worldwide. As a result, fast growing exotics are widely grown in Hong Kong and most of the plantations are monocultures.

With the aim of restoring Hong Kong's forest ecosystem, Kadoorie Farm and Botanic Garden (KFBG) established a Native Tree Nursery in 1997 to research and propagate native trees. Scientific studies continue to be conducted to identify suitable native tree species for afforestation and improve the silvicultural techniques for seedling propagation. Today, the Nursery acts as a source for reforestation and since 1999 about 45000 native tree seedlings have been supplied for transplanting in Hong Kong's countryside.

KFBG has also been working closely with governmental and non-governmental organizations to further the conservation messages. The key education programme is the School Native Tree Planting Scheme which started in 1999. The programme has three aims:

- 1) to enable students to explore the ecological, socio- and cultural importance of native trees;
- 2) to inspire a sense of joy, wonder and connection with nature; and
- 3) to integrate context about the conservation of local habitats and native wildlife with the school curriculum.

Learning in the environment illustrates the concepts much better than a thousand words. KFBG has identified trails that can be used as learning sites for students in both native tree woodlands and exotic tree plantations. Most of the native tree trails are located inside the so-called Feng Shui woods in Hong Kong. These Feng Shui woods are usually found at the back of old villages. In ancient times, villagers believed that a forest behind their houses would give them protection, thus the old saying that houses should be 'backed with solidity and face the void'. Its importance was undeniable and multi-faceted: it provided a vital resource to villagers, aided the village's fortune by its position in the landscape through receiving fertile rains and

Left: Chinese New Year Flower, a native tree of Hong Kong



Right: The Feng Shui woods sustain over 200 native tree species

dispensing good energy. The Feng Shui woods have grown to sustain over 200 native tree species and are now the last frontiers of native trees in Hong Kong. Through studying the Feng Shui woods, students reconnect themselves with the living memory of Hong Kong and of our ancestors, as well as the last homes for many species of native wildlife and plants.

Another key component of the Scheme is the seedling caring activity. Schools are encouraged to 'adopt' native tree seedlings from KFBG nursery in order to give students experience in day-to-day seedling caring for up to six months. During this period,

Below: Students plant 'their' tree seedlings at the Ten-Year planting site



curriculum-linked or extra-curriculum activities are organised in school grounds. These include creative writing and organic gardening activities, scientific studies of native tree growth rates, nutritional values of seeds and their contribution to wildlife and cultural studies of native trees and people's life. Annual tree planting days are arranged in spring for students to plant 'their' seedlings in the countryside. Native trees are planted and emotional bonds are forged between the students and the countryside.

By 2002, over 2,000 students and teachers joined in with the activities. KFBG has two ten-year planting sites of native trees and participants in the Scheme can witness the restoration process through annual planting and regular caring activities. KFBG is clear that significant conservation success can only be achieved through wide public participation. In order to multiply the education work, an educational CD-Rom was produced in 2002 and training programmes for in-service and pre-service teachers have been started. We are still at the preliminary stage of this new multiplying strategy and suggestions from readers of *Roots* would be much welcomed and appreciated.

## ▲ Resumen

On associe généralement, y compris les habitants vivant sur place, Hong Kong à un univers de béton et on porte peu d'attention à la menace qui pèse sur notre faune et notre flore locales.

Dans le projet éducatif « Arbres indigènes- Racines de vie », Kadoorie Farm and Botanic Garden (KFBG) permet aux étudiants de découvrir les liens écologiques et culturels entre les arbres indigènes et nous. Tout au long du processus d'apprentissage, les étudiants du secondaire ont puisé de l'inspiration et se sont re-connectés avec la partie naturelle de notre pays. Avec l'objectif de développer la participation de tous à la plantation d'arbres indigènes pour restaurer l'écosystème forestier de Hong Kong, ce projet correspond à la philosophie d'un proverbe chinois :

**Si tu as un an, plantes un champ,  
Si tu as dix ans, plantes des arbres,  
Si tu as cent ans, éduques  
hommes.**

## ● Resumé

La gente, incluyendo a los residentes locales, generalmente relaciona Hong Kong con una jungla de cemento y tiene poco conocimiento de los peligros que se le presentan a nuestra flora y fauna. En el proyecto educativo llamado "Arbol autóctono - Raíz de Vida", la Granja y Jardín Botánico de Kadoorie (Kadoorie Farm and Botanic Garden - KFBG) ayuda a los estudiantes a descubrir las conexiones ecológicas y culturales que tenemos con los árboles autóctonos. A través del proceso de aprender, los estudiantes secundarios recibieron inspiración y se reconectaron con la cara natural de nuestra tierra. El proyecto tiene el motivo de promocionar que la gente plante árboles autóctonos para restablecer el ecosistema de los bosques de Hong Kong, y coincide con la visión del proverbio chino que dice:

**Si tienes un año, planta cultivos,  
Si tienes diez años, planta árboles,  
Si tienes cien, educa a la  
humanidad.**

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Etablir des partenariats : un aperçu d'Afrique du Sud

Formando asociaciones: perspectivas desde el sur de África

# Forming Partnerships: Insights from Southern Africa

## ■ Summary

The National Museums of Kenya (NMK) through its Nairobi Botanic Garden has started forming partnerships with schools to develop interpretive opportunities on their school grounds. This article discusses how teachers are being empowered to develop interpretive materials for their schools through a participatory action research model. Before the actual development of the materials, the teachers were first involved in a review study to find out how materials for interpretive environmental education processes are developed and used in the non-formal education sector in Kenya.

A new outlook of developing interpretive opportunities in schools by regarding teachers as a **focus group** as opposed to a **target group** is presented. In embracing focus group discussion as a methodology, interpretation is not set up for teachers, but rather, teachers are allowed to bring in their theory and practice for joint interpretive processes with the NMK Nairobi Botanic Garden to realise development of 'botanic gardens' on their grounds. This has greatly illuminated the partnerships being formed and is a better way of combining formal environmental education efforts with those of non-formal environmental education.

Significantly, this article introduces 'interpretive environmental education processes' as a radical departure from viewing interpretation and environmental education as distinct fields. To this end, the understanding of interpretation as an environmental education process is explored through a critically reflective inquiry process. Interpretation as an education process

is presented as a practical response to the existing constraints arising from curriculum and teaching tensions of implementing environmental education processes in Kenyan schools.

## Introduction

This article draws on recent collaborative research involving a group of teachers from two Kenyan schools in a review and development of interpretation resources and materials. This research is being used as the foundation for a new outreach programme at the National Museums of Kenya (NMK) Nairobi Botanic Garden. Through this programme NMK is helping schools to transform their grounds into sites for environmental learning. The aim is that teachers develop the skills, understanding and motivation needed to change the way environmental education processes are taught in schools. The research described here also forms part of the requirements for a post-graduate course as Rhodes University in South Africa.

One of the aims of the article is to link environmental interpretation and environmental education processes together rather than viewing them as separate fields. The central theme of the article is that by creating partnerships between non-formal and formal education we can better improve environmental literacy and action competency in schools. At the same time we can increase understanding among teachers of interpretation as a process for creating meaning.

If teachers are to become transformative intellectuals (Huckle 1996), they need a critical form of

educational inquiry that allows them to investigate their own practice (Robottom 1987). This means that interpretation resources and materials need to be developed *with* teachers and not *for* them. The important thing is to help teachers 'help themselves' by sharing with them ways of developing the 'tools and skills' of interpretation (Uzzell 1989) so that these may be drawn on in educational processes. My aim was to engage teachers in a process of *mobilising* the 'interpretive capital' within the non-formal education organisations through a participatory action research approach. A case study on development of a school-based 'botanic garden' and interpretive materials to foster environmental learning is presented. This highlights the potential role of teachers as transformative intellectuals in schools.

## Sharing 'tools and skills' of interpretation with teachers

Non-formal education organisations in Kenya play a crucial role in enhancing interpretation and environmental education processes with schools. These organisations include non-governmental environmental education centres and government conservation organisations such as the National Museums of Kenya where I work. A variety of interpretation resources and materials have been developed in these organisations for interpretation and environmental education programmes. The development and use of these resources requires skills and knowledge of interpretation. These 'tools and skills' of interpretation are what I have referred to as *interpretive capital*. At the moment, this interpretive capital is mainly confined within the non-formal education sector.



My argument is that time has come for us non-formal educators and interpreters to start sharing this interpretive capital with teachers in ways that enable them to design their own interpretive experiences in schools to facilitate environmental education processes. However, this does not mean imposing our agenda and mission to schools. Rather, it requires that schools form genuine partnerships with non-formal education organisations to create professional competencies that can support sustained materials development in schools. It is on this premise that I engaged a group of teachers in a process of *mobilising the interpretive capital* within five non-formal education organisations. In this process, non-formal educators from NMK, Kenya Wildlife Services, Wildlife Clubs of Kenya, Giraffe Centre and Butterfly Centre shared their 'interpretive capital' with teachers. By drawing on features of participatory action research I created forums for teachers and non-formal educators to meet and collectively understand how interpretation resources and materials are developed and used in the non-formal education sector to support environmental learning.

Through a series of workshops, focus groups, guided tours and critical reviews of textual interpretive materials, non-formal educators encouraged teachers to examine their understandings, skills and values on

interpretation resources and materials. The groups of teachers and non-formal educators explored practical methods and educational perspectives underlying interpretive practice in the organisations visited. A variety of interpretive materials of interpretive signage, worksheets, trail booklets, interactive displays, teachers' packs, exhibitions and interpretive brochures were used to support environmental learning at these locations. A review on how these materials were developed and used provided useful insights on the role of interpretation in enhancing and enabling environmental education processes. As well as developing partnerships between schools and non-formal organisations, an active partnership between environmental education and interpretation (Ballantyne 1998) is needed to address the often-perceived differences between the two fields.

### Environmental interpretation and education partnerships

Traditionally, environmental interpretation and environmental education processes have been viewed as separate and different fields (Ballantyne and Uzzell 1994, Ballantyne 1998). For example, environmental interpretation is often associated with informal learning experiences for a wide range of visitors within a recreational setting. Such visitors are usually referred to as non-captive audience and are out for an informative

and entertaining experience at interpretive sites. On the other hand, environmental educational processes have been mainly directed towards school groups in diverse areas such as classrooms, outdoors and interpretive sites. The school groups are expected to acquire environmental literacy, action competency and at the same time realise the needs of the school curriculum. Unfortunately, dialectical arguments that focus on the differences in design, content, audience, purpose and educational setting have continued to separate environmental interpretation from environmental education processes. These arguments have tended to undermine the potential role that interpretation can play in socially critical environmental education.

Both interpreters and environmental educators are concerned with the fact that people construct meanings according to their social circumstances. There is a need to act on this commonality between interpreters and environmental educators rather than on the perceived differences. This requires that interpreters and educators create active partnerships and work towards bridging the theoretical gap that exists between them.

The research I undertook with teachers focussed on the relationship between interpretation and its potential to foster critical and action-oriented environmental education processes. Very few interpreters have attempted to inform their practice with educational theories but to understand the relationship between interpretation and environmental education you need to consider their respective theoretical perspectives (Uzzell 1998). These theoretical frameworks include: symbolic interactionism (Charon 2001); social constructionism (Schutz 1967); Vygotskian social constructivism (Vygotsky 1981) and critical pedagogy (Fien 1993).

We drew on these educational ideas and applied the 'tools and skills' of interpretation acquired from the non-formal education organisations to develop interpretation resources to foster environmental learning in two schools. The development process

Right: Science Club students discussing the development of a school botanic garden.



followed a teacher-centred approach that challenged conventional top-down approaches that create a hierarchy of 'developers' and 'technicians' (Robottom 1987, O'Donoghue and Taylor 1988). This approach further strengthened the developed partnerships between NMK and the two schools.

### Developing resources through a teacher-centred approach

Those who work in the non-formal education sector are faced with the challenge of making sure that environmental learning support materials are available that encourage learners to think and respond to environmental problems. More often than not, the tendency has been for us to produce glossy materials that simply emphasise conservation of the biophysical environment. Although the materials may be intended to create awareness and change learners' behaviour, in many cases they are developed without the active involvement of teachers who form the majority of the end users. Teachers are viewed as primarily as technicians whose job it is to implement the materials for environmental learning in their schools. The NMK Nairobi Botanic Garden outreach programme supports

teachers in developing interpretation resources and materials on their school grounds. This shift from the top-down approach towards a teacher-centred one recently took place in the two schools that NMK Nairobi Botanic Garden supported to develop interpretation resources on their grounds. Central to this shift was the formation of partnerships between NMK and three other non-formal education organisations. These partnerships created an enabling environment in which teachers were empowered to change and improve on their own practice of interpretation resource and materials development. I will now focus on the actual development of a 'botanic garden' and materials in one of the schools.

### Developing a school-based 'botanic garden' and interpretive materials

In November 2000, two teachers and a group of Science Club students from Samaj School in Nairobi visited the NMK Nairobi Botanic Garden for a guided tour with a focus on medicinal plants. What was a normal school visit however, became different when after the guided tour the teachers sought asked if we would help develop a 'botanic garden' in their grounds as a

club project. Samaj School is situated in the western suburbs of the City of Nairobi and has a population of 800 students, from nursery to form six, and fifty members of staff. An inquiry into the status of environmental education at the school revealed an emphasis on both teacher-centred and discipline-centred approaches to teaching and learning processes. They had no specific guidelines for implementing environmental education processes across the curriculum. To a great extent environmental education processes were dependent on initiatives from the non-formal education sector as reflected in the existence of environmental clubs whose support originated elsewhere. None of the five teachers on the project team had received any form of in-service training on environmental education. Besides this, the teachers claimed that the pre-service training they had received in environmental education was inadequate for their teaching contexts. The development of a school-based 'botanic garden' at the school was aimed at raising the profile of environmental education processes at Samaj. The process followed a participatory action research model that involved a spiral of self-reflective cycles of planning, acting and reflecting.



Left: The site before the school botanic garden was developed

## Formulating resource development plans

A team of five teachers was selected to work with NMK Nairobi Botanic Garden to realise the development of a 'botanic garden' and materials to foster environmental learning at the school. This was after the school management had adopted the idea that had initially been conceived at a club level. A process of realising the goals was then initiated through a whole school approach. In collaboration with NMK, the teachers first formulated broad plans outlining project goals, themes envisaged, methods and financial implications of the project. Eight themes that reflected those at NMK Nairobi Botanic Garden were proposed. These were: medicinal plants; succulents; wetlands; rare plants area; memorial area; recreation corner; butterfly corner and orchard. Plans on specific materials that would support environmental learning at the 'botanic garden' were also collaboratively formulated. A publicity brochure, a trail leaflet, two worksheets, interpretive signage and interpretive labels were planned for. Throughout this phase, teachers contributed to the generation of plans. The plans were approved by the School Board and later implemented in collaboration with NMK and a number of other organisations.

## Implementing the formulated plans through critical reflection

Drawing on teachers' theory and practice, and also the interpretive capital mobilised as discussed earlier in this paper, the formulated plans were implemented through a series of focus group meetings in the school. The teachers were engaged in a self-reflective process of examining the relationship between the 'mobilised' interpretive capital and the development of interpretation resources and materials that foster environmental learning. The actual development of the school 'botanic garden' entailed transforming an under-utilised area within the school grounds into a site for environmental learning. To do this, one of the teachers designed the area on paper to indicate the proposed themes and pathways. The area was then dug up and filled



Right: Opening of the school botanic garden

with forest soil by applying landscaping skills. The availability of a qualified gardener and a member of the Board of Trustees who had some landscaping skills at the school made this exercise easier. In addition, NMK botanic garden staff provided useful inputs in these initial landscaping processes. Later a professional horticulturalist was invited to further evaluate and polish up the landscaping of the site. NMK Nairobi Botanic Garden, commercial nurseries and other non-formal education organisations provided plants as a result of partnerships that had been created.

## Conclusion

Through partnerships with schools and other non-formal education organisations, the NMK Nairobi Botanic Garden has started working with teachers to transform school grounds into sites for critical environmental interpretation and education processes. What began as a one-off project has turned into a reflexive process and has resulted in changes in the way school grounds are used for environmental learning as well as the way materials are developed. By involving schools in collaborative research to investigate their own practice, the potential role of botanic gardens in enabling teachers to become transformative intellectuals has been highlighted. The participatory action research model that was applied during the NMK Nairobi Botanic Garden pilot outreach programme has proven to be a powerful form of professional development medium as it grew out of the teachers' own specific contexts. Professional development was not done on the teachers. Rather,

teachers were allowed to be in control of the process of developing interpretation resources and materials by their collective planning, action and reflection. The role teachers can play as researchers, reflective practitioners, interpreters and materials developers through genuine partnerships became evident. Fundamentally, botanic gardens need to start viewing teachers as reflective practitioners with significant contributions to make to environmental interpretation and education processes instead of merely regarding them as 'target groups'.

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Une nouvelle perspective de développement de situations d'interprétation dans les écoles consiste à prendre les enseignants comme un groupe test plutôt que comme un groupe cible. En considérant la discussion avec le groupe test comme une méthodologie, l'interprétation n'est pas construite pour les enseignants, mais ce sont plutôt les enseignants qui testent leur théorie et leur pratique en rejoignant la démarche d'interprétation menée au Jardin Botanique de Nairobi (NMK) dans le but de développer un "jardin botanique" dans leur école. Ceci a largement enrichi le partenariat en cours et c'est une meilleure méthode pour allier les efforts de l'éducation à l'environnement formelle avec cette éducation à l'environnement non formelle.

Cet article aborde de façon claire le "processus d'éducation à l'interprétation de l'environnement" en considérant l'interprétation et l'éducation à l'environnement comme deux domaines distincts. A cette fin, la compréhension de l'interprétation comme un processus d'éducation à l'environnement est explorée au moyen d'un processus de questionnement critique et réflexif. L'interprétation en tant que processus d'éducation est présenté comme une réponse concrète aux contraintes issues du curriculum et aux difficultés des enseignants pour introduire les processus d'éducation à l'environnement dans les écoles du Kenya.

Se presenta una nueva perspectiva sobre como desarrollar las oportunidades interpretativas en los colegios. Esto se trata de considerar a los profesores como **grupo de enfoque** y no como **grupo objetivo**. En adoptar el tratamiento de grupo de enfoque como metodología, la interpretación no se prepara para los profesores, sino que a estos mismos se les permite traer sus teorías y prácticas para conseguir procesos interpretativos conjuntamente con el Jardín Botánico de Nairobi y así conseguir una conversión de sus terrenos en 'jardines botánicos'. Esto ha ayudado mucho a los convenios de colaboración que se van formando y es una mejor manera de combinar la educación medio ambiental formal con la no-formal.

Significativamente, este artículo introduce 'los procesos de educación medio ambiental interpretativos' como un desvío radical del punto de vista que considera a la interpretación y la educación medio ambiental como temas distintos. Con este fin, se explora la consideración de la interpretación como un proceso de educación medio ambiental a través de un proceso crítico de reflexión. La interpretación como proceso educativo se presenta como una respuesta práctica a las limitaciones existentes que derivan de las tensiones causadas por llevar a cabo los procesos de educación medio ambiental dentro del currículo, y los métodos de enseñanza existentes en los colegios de Kenya.

## ▲ Résumé

Le Muséum National du Kenya (NMK), par l'intermédiaire du Jardin Botanique de Nairobi, a commencé à mettre en place des partenariats avec des écoles pour développer des situations d'interprétation dans le territoire de l'école. Cet article traite de la façon dont des enseignants prennent en charge la conception de matériel d'interprétation pour leurs écoles à partir de modèles élaborés au cours de recherches-actions. Avant la mise en place du matériel, les enseignants ont tout d'abord été impliqués dans une étude pour découvrir comment les processus et les matériaux d'interprétation sont développés et utilisés dans le cadre de l'éducation non formelle au Kenya.

## ● Resumen

A través del Jardín Botánico de Nairobi, los museos nacionales de Kenya (NMK) han comenzado a establecer convenios con colegios para desarrollar las oportunidades interpretativas de los terrenos colegiales. Este artículo debate como los profesores están siendo ayudados a desarrollar materiales interpretativos a través de un modelo de participación y acción investigadora. Antes de desarrollar los materiales, los profesores tomaron parte en un estudio de revisión para aprender como desarrollar tales materiales para la interpretación en temas de educación medioambiental y como son utilizados en el sector de educación no-formal en Kenya.

**Abel Atiti is grateful to the Australian Agency for International Development (ausaid) for providing a travel grant that enabled him attend the 5th BGCI International Congress on Education in Botanic Gardens in Sydney, Australia, where he presented this paper.**

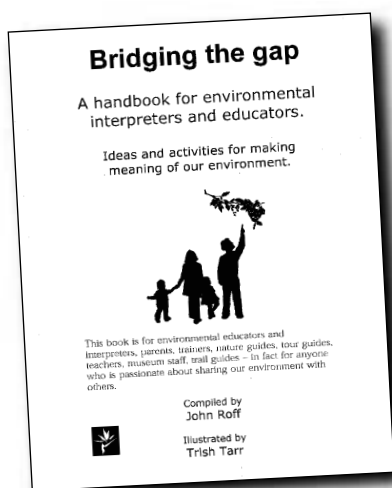
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# Disponible

# Resources

## Recursos

### ■ Resources



#### **Bridging the gap – A handbook for environmental interpreters and educators**

**John Roff (2003), Share-Net, P.O. Box 394, Howick, 3290, South Africa, Email: [sharenet@futurenet.co.za](mailto:sharenet@futurenet.co.za).**

**Price 10 Rand.**

**Language: English**

This concise A5 sized handbook contains important principles and numerous activities for interpreting the environment. Especially useful for botanical garden educators and interpreters, it will also be helpful for nature guides, tour guides, museum staff and teachers. A list of principles of interpretation is given, as well as useful learning theories and a simple explanation of interpretive sign design. The handbook is also available to download in .pdf format from the following website: [www.nbi.ac.za/interpret/links.htm](http://www.nbi.ac.za/interpret/links.htm) which also contains useful links to other interpretation websites.

### ▲ Disponible

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**[sharenet@futurenet.co.za](mailto:sharenet@futurenet.co.za).**

**Prix 10 Rand. Langue: Anglais**

Ce petit livre concis de format A5 contient d'importants principes et de nombreuses activités pour l'interprétation de l'environnement. Particulièrement utile pour les éducateurs et interprètes des jardins botaniques, il sera aussi une aide aux guides nature, guides de visites, les employés de musées et les enseignants. Les principes de l'interprétation sont énumérés, de même que des théories d'apprentissage et une explication simple de la signalétique interprétative. Le livre est téléchargeable au format pdf à partir du site: [www.nbi.ac.za/interpret/links.htm](http://www.nbi.ac.za/interpret/links.htm) qui contient aussi des liens utiles vers d'autres sites d'interprétation.

**Children's Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care, Roger Hart (1997), Earthscan publié en association avec l'UNICEF, Earthscan Publications Ltd, 120 Pentonville Road, London N1 9JN, UK.**

**Tel: 020 7278 0433.**

**Fax: +44 (0)20 7278 1142.**

**Email: [earthinfo@earthscan.co.uk](mailto:earthinfo@earthscan.co.uk). Prix 19.95 GBP.**

Roger Hart écrit avec conviction que tous les enfants peuvent jouer un rôle central et à long terme pour le développement durable, si leur

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**John Roff (2003), Share-Net, P.O. Box 394, Howick, 3290, South Africa, Email:**

**[sharenet@futurenet.co.za](mailto:sharenet@futurenet.co.za).**

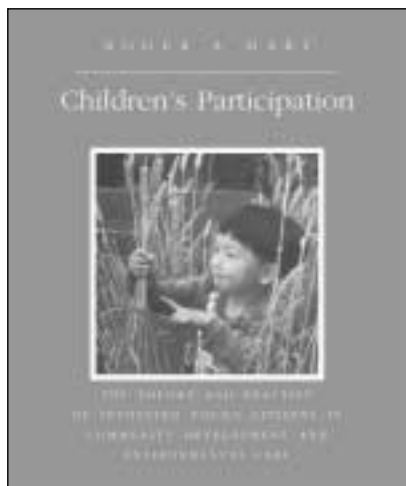
**Precio 10 Rand. Idioma: Inglés**

Este conciso manual de tamaño A5 contiene importantes principios y numerosas actividades para la interpretación del medio ambiente. Especialmente es útil para educadores e intérpretes de jardines botánicos, y también para guías de la naturaleza, guías de excursiones, personal de museos y maestros. Se proporciona una lista de principios, así como también teorías de utilidad sobre aprendizaje y una explicación sencilla sobre diseño de señales interpretativas. El manual está también disponible en formato pdf en el siguiente website: [www.nbi.ac.za/interpret/links.htm](http://www.nbi.ac.za/interpret/links.htm) que también contiene enlaces ligas útiles a otros websites de interpretación.

**Children's Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care, Roger Hart (1997), Earthscan Published in association with UNICEF, Earthscan Publications Ltd, 120 Pentonville Road, London N1 9JN, UK. Tel: 020 7278 0433. Fax: +44 (0)20 7278 1142. Email: [earthinfo@earthscan.co.uk](mailto:earthinfo@earthscan.co.uk). Precio 19.95 GBP.**

Roger Hart escribe con la convicción de que todos los niños pueden jugar un papel central y duradero en

## ■ Resources



**Children's Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care, Roger Hart (1997), Earthscan Published in association with UNICEF, Earthscan Publications Ltd, 120 Pentonville Road, London N1 9JN, UK. Tel: 020 7278 0433. Fax: +44 (0)20 7278 1142. Email: earthinfo@earthscan.co.uk. Price 19.95 GBP.**

Roger Hart writes with the conviction that all children can play a central and lasting role in sustainable development if their participation is taken seriously and if communities recognise their developing competencies and unique strengths. The book emphasises the importance of genuine participation and the need for children to be involved in the definition of environmental problems as well as become representative, critical voices within their communities. Using detailed case studies from urban and rural, poor and middle-class communities in both the developed and developing worlds, and including photos, figures, tables and boxes, this book makes an excellent guide to both the theory and practice of children's participation. It introduces the organising principles, successful models, practical techniques and resources for involving young people in environmental projects, with useful further reading and contact addresses.

## ▲ Disponible

participation est prise au sérieux et si les communautés reconnaissent leurs compétences en développement et leurs atouts uniques. Le livre démontre l'importance d'une participation réelle et la nécessité pour les enfants qu'ils s'engagent pour la définition des problèmes environnementaux et deviennent des voix représentatives et critiques au sein de leurs communautés.

A l'aide d'études de cas détaillées de communautés urbaines et rurales, des classes pauvres et moyennes, aussi bien dans les pays développés que dans les pays en voie de développement, avec des photos, des graphiques, des tables et des encadrés, ce livre est un excellent guide théorique et pratique sur la participation des enfants. Il introduit les principes d'organisation, des modèles qui fonctionnent, des techniques pratiques et du matériel pour faire participer les jeunes gens dans les projets environnementaux, avec des références utiles de contacts et de lectures complémentaires.

**Recopilación de Publicaciones de Educación Ambiental: 1. Cuadernos Didácticos de Medio Ambiente. Real Jardín Botánico Juan Carlos I, Campus de la Universidad de Alcalá, Residencias Universitarias, 28801 Alcalá de Henares (Madrid), Spain. Email: jardin.botanico@uah.es Tel: 00 91 881 9803. Fax: 0091 882 1585. Website: www.rjbalcala.com Prix: 45 Euros. Langue: Espagnol**

Ce CD-ROM est le premier dans une série de compilations d'activités et de publications sur l'éducation à l'environnement produites et utilisées par le Real Jardín Botánico Juan Carlos I à l'intention des étudiants de l'enseignement secondaire. Facile à utiliser, le CD permet d'explorer le jardin lui-même; ses objectifs, ses ressources et ses bâtiments. Un intéressant Vidéo-clip avec commentaire fait vivre le jardin sous nos yeux. Le contenu principal est une série de 26 études avec des sections pour les enseignants et pour les

## ● Recursos

desarrollo sostenible si su participación es tomada seriamente y si las comunidades reconocen sus capacidades y fortalezas únicas. El libro enfatiza la importancia de genuina participación y la necesidad para niños de estar involucrados en la definición de problemas ambientales así como también empezar a ser voces representativas y críticas dentro de sus comunidades. Usando detallados casos de estudios de habitantes urbanos y rurales, pobre y clase media comunidades en ambos mundos el desarrollado y el en vía de desarrollo, incluyendo fotos, figuras, tablas y cajas, este libro hace un excelente guía para ambos la teoría y la práctica de participación de los niños. Este introduce los principios de organización, modelos exitosos, técnicas prácticas y recursos para involucrar gente joven en proyectos medioambientales, con otras lecturas útiles y direcciones de contacto.

**Recopilación de Publicaciones de Educación Ambiental: 1. Cuadernos Didácticos de Medio Ambiente. Real Jardín Botánico Juan Carlos I, Campus de la Universidad de Alcalá, Residencias Universitarias, 28801 Alcalá de Henares (Madrid), Spain. Email: jardin.botanico@uah.es Tel: 00 91 881 9803. Fax: 0091 882 1585. Website: www.rjbalcala.com Precio: 45 Euros. Idioma: Español**

Este CD Rom es el primero donde existe una serie de compilaciones de actividades de educación ambiental y publicaciones producidas y utilizadas por el Real Jardín Botánico Juan Carlos I, para estudiantes de escuela secundaria. Simple de usar, el CD te permite explorar el jardín por sí mismo; objetivos, recursos y facilidades. Un interesante video clip con narración trae el jardín a la vida. El principal contenido es una serie de 26 libros de estudio, con secciones para maestros y alumnos, estructurado y puesto en un formato estandarizado.

Los títulos incluyen 'Plantas Medicinales', 'Diversidad de Plantas', 'Impacto ambiental', 'Plantas y

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**Recopilación de Publicaciones de Educación Ambiental: 1. Cuadernos Didácticos de Medio Ambiente.** Real Jardín Botánico Juan Carlos I, Campus de la Universidad de Alcalá, Residencias Universitarias, 28801 Alcalá de Henares (Madrid), Spain. Email: [jardin.botanico@uah.es](mailto:jardin.botanico@uah.es) Tel: 00 91 881 9803. Fax: 0091 882 1585. Website: [www.rjbalcala.com](http://www.rjbalcala.com) Price: 45 Euros. Language: Spanish

This CD Rom is the first in what will be a series of compilations of environmental education activities and publications produced and utilised by the Real Jardín Botánico Juan Carlos I, for secondary school students. Simple to use, the CD allows you to explore the garden itself; aims, resources and facilities. An interesting video clip with narration brings the garden to life. The core content is a series of 26 study books, with sections for teachers and pupils, structured and laid out to a standardised format. Titles include 'Medicinal Plants', 'Plant Diversity', 'Environmental Impact', 'Plants & Human Nutrition', 'Festivals and Folk Traditions' and a range of pollution topics and local case studies. Each publication can be printed out, complete with colour images and worksheets. Links to websites further expand the provision of information available via this resource.

**Greening School Grounds: Creating Habitats for Learning,** Tim Grant and Gail Littlejohn, (eds), (2001), Green Teacher, ISBN 0-86571-436-3. Grades K-12. Green Teacher, 95 Robert Street, Toronto, ON, M5S 2K5, Canada or Green Teacher, PO Box 452, Niagara Falls, NY, 14304-0452. USA. Tel:(416) 960-1244. Fax: (416) 925-3474. Email [info@greenteacher.com](mailto:info@greenteacher.com). Website: [www.greenteacher.com](http://www.greenteacher.com). Price: US\$16.95.

Greening School Grounds aims to encourage schools to increase their green space and biodiversity through hands-on projects ranging from tree nurseries to school composting to

## ▲ Disponible

élèves, structurés et mis en page dans un format standardisé. Parmi les titres on retrouve: Plantes médicinales, Diversité végétale, Impacts sur l'environnement, Plantes et alimentation humaine, Festivals et traditions folkloriques et un éventail de sujets sur la pollution et des exemples-types locaux. Chaque publication peut être imprimée complètement avec des images en couleur et des fiches de travail. Des liens vers des pages Internet augmentent encore le nombre d'informations disponibles à travers cette ressource.

**Greening School Grounds: Creating Habitats for Learning,** Tim Grant and Gail Littlejohn, (eds), (2001), Green Teacher, ISBN 0-86571-436-3. Grades K-12. Green Teacher, 95 Robert Street, Toronto, ON, M5S 2K5, Canada or Green Teacher, PO Box 452, Niagara Falls, NY, 14304-0452. USA. Tel:(416) 960-1244. Fax: (416) 925-3474. Email [info@greenteacher.com](mailto:info@greenteacher.com). Site Internet: [www.greenteacher.com](http://www.greenteacher.com). Prix: US\$16.95.

*Greening School Grounds* (« Verdir les cours d'école») a pour objectif d'encourager les écoles à augmenter leurs espaces verts et leur biodiversité par des projets pratiques comme des pépinières, le compostage à l'école ou des jardins de plantes indigènes. Sont inclus des articles détaillés sur les jardins sur toits, les jardins nordiques, les jardins de désert, des jardins de papillons, des étangs et la restauration de prairies. Il y a plein d'activités d'extérieur et des liens vers des programmes scolaires, aussi bien qu'une bibliographie de ressources éducatives et une liste des organismes de financement et de formation. *Greening School grounds* est un recueil des meilleurs articles sur le sujet du verdissement des cours d'école parus dans *Green Teacher*, une ONG qui publie des informations pour aider les éducateurs aussi bien à l'intérieur qu'à l'extérieur des écoles à promouvoir la prise de conscience des problèmes de mondialisation et d'environnement parmi les jeunes.

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Nutrition Humana', 'Festivales y Tradiciones Folkloricas' y un rango de tópicos sobre contaminación y casos locales de estudio. Cada publicación puede ser imprimida, completa con imágenes a color y hojas de trabajo. Enlaces a websites expanden la información disponible via este recurso.

**Greening School Grounds: Creating Habitats for Learning,** Tim Grant and Gail Littlejohn, (eds), (2001), Green Teacher, ISBN 0-86571-436-3. Grades K-12. Green Teacher, 95 Robert Street, Toronto, ON, M5S 2K5, Canada or Green Teacher, PO Box 452, Niagara Falls, NY, 14304-0452. USA. Tel:(416) 960-1244. Fax: (416) 925-3474. Email [info@greenteacher.com](mailto:info@greenteacher.com). Website: [www.greenteacher.com](http://www.greenteacher.com). Precio: US\$16.95.

*Greening School Grounds* (Enverdeciendo la escuela) pretende motivar a las escuelas a incrementar sus espacios verdes y biodiversidad a través de un proyecto de trabajo que abarca desde árboles en los viveros a composteras en las escuelas a plantas nativas en el jardín. Se incluyen detallados artículos sobre jardines de azotea, jardines del norte, jardines del desierto, jardines de mariposas, estanques y restauración de praderas. Hay una gran cantidad de actividades al aire libre y el currículum liga así como también a la bibliografía de recursos de aprendizaje y lista de patrocinadores y organizaciones para la capacitación. *Greening School Grounds* es un compendio de los mejores artículos de los patios de escuela y actividades de *Green Teacher* (El Maestro Verde), una organización de caridad que publica recursos para apoyar a los educadores, ambos dentro y fuera de las escuelas, para promover la alerta global y ambiental entre la gente joven.

**My Nana's Remedies/Los Remedios De Mi Nana** by Roni Capin Rivera-Ashford, Edna San Miguel (Illustrator), 2002, Arizona-Sonora Desert Museum Press.

## ■ Resources

native-plant gardens. Detailed articles are included on rooftop gardens, far-north gardens, desert gardens, butterfly gardens, ponds and prairie restorations. There are plenty of outdoor classroom activities and curriculum links as well as a bibliography of learning resources and a list of funders and training organizations. *Greening School Grounds* is a compendium of the best schoolyard greening articles and activities from *Green Teacher*, a non-profit organization which publishes resources to help educators, both inside and outside of schools, to promote global and environmental awareness among young people.

**My Nana's Remedies/Los Remedios De Mi Nana by Roni Capin Rivera-Ashford, Edna San Miguel (Illustrator), 2002, Arizona-Sonora Desert Museum Press. Bilingual: English/Spanish. ISBN: 1886679193. If you order with Amazon.com 15% of proceeds go toward Arizona-Sonora Desert Museum programmes. Price \$12.76 (free package and postage for orders over \$25).**

This 32 page children's book (aged 4-8) is a heart warming tale of a young child and her grandmother who prepares traditional home remedies. The book is full colour with lovely botanical drawings and eye catching and humorous illustrations. An appendix lists the native medicinal plants used in the remedies.

**<http://www.birdlife.org.za>**

Two useful resources are available free to download from this website:

*Learning for Sustainable Living* is for use with secondary school students. It has been developed and produced through a series of creative workshops by teachers, subject advisers and other education professionals. Information and novel ideas are presented to facilitate the teaching and learning of environmental education through six themes: ecology, water, air, soil, energy and population

*A Teacher's Guide to the World Summit on Sustainable Development 2002* is

## ▲ Disponible

**My Nana's Remedies/Los Remedios De Mi Nana by Roni Capin Rivera-Ashford, Edna San Miguel (Illustrator), 2002, Arizona-Sonora Desert Museum Press.**

**Bilingual: English/Spanish. ISBN: 1886679193. Si vous commandez par Amazon.com 15% des recettes reviendront aux programmes du Arizona-Sonora Desert Museum. Prix \$12.76 (emballages et envoi gratuits pour les commandes de plus de \$25).**

Ce livre de 32 pages, destiné aux enfants de 4-8 ans, est une histoire touchante d'une jeune enfant et de sa grand-mère qui prépare des remèdes populaires traditionnels. Le livre est en couleurs avec des jolis dessins botaniques et des illustrations attrayantes faites avec humour. Une annexe donne la liste des plantes médicinales indigènes utilisées dans les remèdes.

**<http://www.birdlife.org.za>**

Deux ressources utiles sont téléchargeables gratuitement à partir du site :

*Learning for Sustainable Living* se prête à l'utilisation avec des étudiants du secondaire. Il a été développé et produit à travers une série d'ateliers créatifs par des enseignants, conseillers et autres professionnels de l'éducation. Des informations et des idées nouvelles sont présentées pour faciliter l'enseignement et l'apprentissage en matière d'éducation à l'environnement par le biais de six thèmes: écologie, eau, air, sol, énergie et population.

*A Teachers Guide to the World Summit on Sustainable Development 2002* est destiné à être utilisé avec des étudiants âgés de 11-14 ans. Le guide donne des informations et propose des idées pour des activités en relation avec six thèmes: biodiversité, dégradation des sols, changement du climat, océans et pêche, réduction de la pauvreté et globalisation. Bien que développé initialement pour l'Afrique du Sud, le guide peut facilement être adapté pour l'utilisation par les éducateurs dans d'autres pays.

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**Bilingual: English/Spanish. ISBN: 1886679193. Si tu ordenas con Amazon.com 15% del beneficio se destina a los programas del Museo del desierto de Arizona. Precio \$12.76 (empaques y envío gratis en ordenes arriba de \$25).**

Este libro de 32 páginas destinado a niños (de 4-8 años) es la historia enternecedora del corazón de un niño y su abuela quien prepara remedios caseros tradicionales. El libro es a todo color con hermosos dibujos botánicos y cautivadores de la vista y divertidas ilustraciones. Un apéndice lista las especies medicinales usadas en los remedios.

**<http://www.birdlife.org.za>**

Dos recursos útiles disponibles para bajarse de este website:

*Learning for Sustainable Living* (Aprendiendo para una forma de vida sostenible) es para usarse con estudiantes de escuela secundaria. Ha sido desarrollado y producido a través de una serie de talleres creativos para los maestros, tutores de temas y otros profesionales de la educación. Información e ideas novedosas son presentadas para facilitar la enseñanza y el aprendizaje de educación ambiental a través de seis temas: ecología, agua, aire, suelo, energía y población. Una guía para los maestros *A Teacher's Guide to the World Summit on Sustainable Development 2002* es para usarse con estudiantes de 11-14 años de edad. La guía proporciona información e ideas sobre actividades relacionadas a seis temas: biodiversidad, degradación



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for use with students aged 11 to 14 years old. The guide provides information and ideas on activities related to six themes: biodiversity, land degradation, climate change, oceans and fisheries, poverty reduction and globalization. Although drafted for use in South Africa, the guide can be adapted easily for use by educators in other countries.

### **www.allofus.net**

*All of Us: Environmental Education Dossiers* aims to share concepts and experiences in the field of environmental education. There are currently 42 dossiers for people to browse in English or Catalan. Each dossier includes articles and facts about the issues, mini case studies by organisations working in the field, recommended reading and suggested positive actions. Contributors are all well-known and respected authorities in their field. There is a free subscription link at the bottom of each main dossier page.

### **www.osearth.com**

*o.s. EARTH, Inc. (OSE)* provides experiential, simulation-based learning and training about world resources and issues. Its flagship product, the Global Simulation Workshop was developed over a thirty-year period by World Game Institute ([www.worldgame.org](http://www.worldgame.org)) a non-governmental organization affiliate of the United Nations dedicated to providing the perspective and information needed to solve the critical problems facing global society. Also available at [osearth.com](http://osearth.com) is the World Fact Game, an informative, fact-filled test of global knowledge suitable for use as a team building exercise. The site is still being developed and will soon include resources for teachers and students.

### **www.fundsnetsservices.com**

This web site provides links to hundreds of foundations and grant makers interested in supporting environmental projects.

## ▲ Disponible

### **www.allofus.net**

*All of Us : Educational Dossiers* vise à partager des concepts et des expériences en matière d'éducation à l'environnement. Il y a actuellement 42 dossiers à découvrir en anglais ou en catalan. Chaque dossier contient des articles et des informations sur le sujet, des mini-études de cas par des organisations travaillant sur le terrain, des lectures recommandées et des actions positives possibles. Les contributions proviennent d'autorités reconnues et respectées dans leur domaine. Un lien pour une inscription gratuite se trouve en bas de chaque page principale des dossiers.

### **www.osearth.com**

*o.s. EARTH, Inc. (OSE)* fournit un apprentissage et une formation par l'expérience et sur base de simulations au sujet des ressources mondiales et de leurs problèmes. Son produit principal, *le Global Simulation Workshop* (« Atelier de simulation globale ») fut développé durant une période de trente ans par le *World Game Institute*, une ONG affiliée aux Nations Unies, dont la mission est de fournir la perspective et les informations nécessaires pour résoudre les problèmes critiques auxquels la société mondialiste est confrontée. Est aussi disponible sur [osearth.com](http://osearth.com) le *World Fact Game*, un test intéressant bourré d'informations qui se prête à des exercices de formation d'équipes. Le site est encore en développement et comprendra bientôt des ressources pour les enseignants et les étudiants.

### **www.fundsnetsservices.com**

Ce site Internet fournit des liens vers des centaines de fondations et des organismes pourvoyeurs de bourses ayant pour objectif de soutenir des projets environnementaux.

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de la tierra, cambio climático, océanos y pesca, pobreza y reducción de la pobreza y globalización. A pesar de que esta diseñado para usarse en Sudáfrica, la guía puede ser adaptada fácilmente para su uso por los educadores en otros países.

### **www.allofus.net**

*El sitio All of Us: Environmental Education Dossiers* pretende compartir los conceptos y experiencias en el campo de educación ambiental. Hay actualmente 42 archivos para que la gente revise en inglés o Catalán. Cada archivo incluye artículos y hechos acerca de los números, mini casos de estudio por los organizaciones trabajando en el campo, lecturas recomendadas y sugiriendo acciones positivas. Todos los participantes son autoridades bien conocidos y respetadas en su campo. Hay una suscripción de enlace gratuita en la base de cada página principal del archivo.

### **www.osearth.com**

*o.s. EARTH, Inc. (OSE)* provee experiencia, aprendizaje basado en simulación y entrenamiento acerca de los recursos mundiales y temas. Su producto bandera, el Taller de Simulación Global fue desarrollado <http://www.geocities.com/impatients63/PlantsforDyeing.htm> en un periodo de 30 años por el Instituto Mundial del Juego ([www.worldgame.org](http://www.worldgame.org)) una organización no gubernamental afiliada a las naciones Unidas dedicada a proveer la perspectiva y información necesaria para resolver el problema crítico que encara la sociedad global. También esta disponible en [osearth.com](http://osearth.com) el World Fact Game, un test informativo, lleno de hechos de conocimiento global para su uso como un ejercicio para construcción del equipo. El sitio esta siendo desarrollado y pronto incluirá los recursos para los maestros y los estudiantes.

### **www.fundsnetsservices.com**

Este website provee enlaces a cientos de fundaciones y otorgadores de apoyo económico interesados en apoyar proyectos ambientales.



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